C.O.

SHIAWASSEE NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

1970

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

SAGINAW, MICHIGAN

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Shiawassee Months of September to December 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-billed Grebe			20	Sept.	2	Oct.				20
Great Blue Heron			60	Aug.	3	Dec. 6				60
Green Heron			20	Aug.	1	Sept.				20
Common Egret			20	Aug.	2	Sept.				20
Snowy Egret			1	Aug.	1	Aug.				1
Black-crowned N. Heron			35	Aug.	2	Sept.				35
Sora Rail			15	Sept.		Sept.				15
Common Gallinule			30	Aug.	2	Oct.				30
II. Shorebirds, Gulls and Terns:										
Killdeer			40	Sept.		Sept.				40
Yellowlegs			30	Sept.		Sept.				30
Ring-billed Gull			100	Oct.	Still Present					200
Herring Gull			50	Oct.	Still Present					50

(over)

(1)	(2)	(3)		(4)		(5)	(6)
III. Doves and Pigeons:							
Mourning dove		250	Sept.	Still	Present		250
White-winged dove							
IV. Predaceous Birds:							
Golden eagle							
Duck hawk							
Horned owl	Resident Species						
Magpie							
Raven							
Crow	Resident Species						
Bald Eagle		2	Sept.	1	Dec. 6		2
Marsh Hawk		10	Oct.	2	Nov.		10
Red-tailed Hawk		20	Sept.	2	Dec.		20
Am. Rough-legged Hawk		1	Oct.	Winter	Resident		20
Turkey Vulture		15	Sept.	2	Oct.		15
Sparrow Hawk		20	Sept.	Still	Present		20

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Shiawassee Year 1960

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/1-3	277	1432	Canada Goose	120	U	120	277	120
10/4-10	446	2371	Canada Goose	75	U	75	446	75
10/11-17	432	2276	Canada Goose	214	U	214	432	214
10/18-24	338	1640	Canada Goose - 84; Blue Goose - 5	89	U	89	338	89
10/25-31	403	2227	Canada Goose	114	U	114	403	114
11/1-7	416	2297	Canada Goose	100	U	100	416	100
11/8-14	384	2016	Canada Goose	20	U	20	384	20
Sub Totals	2,696	14,259	Blue Goose : 5 Canada Goose : 727	732	U	732	2,696	732
Permits Issued by State								
10/1-31	385	1500	Canada Goose	127	U	127	385	127
11/1-14	137	468	Canada Goose	7	U	7	137	7
TOTAL	3,218	16,227	Canada Goose : 861 Blue Goose : 5	866	U	866	3,218	866

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Shiawassee Months of September to December, 1970

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Croplands, Bottomland hardwoods & marsh- 8,000 Ac.	800	0	0					10	Rarely observed

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce - swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Shiawassee Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	Bottomland hardwoods, croplands, Marsh- 8,000 ac.	350	11	0					2			840	735	1:4

Remarks: Estimated removals by hunting include 40 taken during the firearms season, 40 during the archery season, and an estimated 30 illegal and/or unretrieved kills.

Reported by Refuge Personnel

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

17060

3-1755
Form NR-5

DISEASE

Refuge Shiawassee Year 1970

Botulism

Period of outbreak None

Period of heaviest losses

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage)

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life

Remarks

Lead Poisoning or other Disease

Kind of disease Lead Poisoning

Species affected Whistling Swan

Number Affected

Species	Actual Count	Estimated
Whistling Swan	3	

Number Recovered

Number lost 3 Actual Count

Source of infection Presumed on wintering area

Water conditions

Food conditions Each year a small loss of swans are recorded during the spring migration. It is presumed the lead is ingested on the wintering grounds and birds weaken and die enroute to nesting grounds.

Remarks

INT.-DUP., D.C.- 53818-59

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Shiawassee Year 19 70

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
							Farm Unit 1A	2 lbs. acre	.54 acres	Ladino Clover	May		
							Riverside Dike	2 lbs. acre	2.7 acres	Ladino Clover	April		
							Picnic Area	2 lbs. acre	.5 acres	Ladino Clover	May		
							Pool 1B East Dike	12 lbs. acre	3.6 acres	Bromegrass Tall fescue Ryegrass & Ladino clover mixture	May		
							Nature Trail	2 lbs. acre	1.0 acres	Ladino Clover	May		

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

76148

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge SHIAWASSEE REFUGE County SAGINAW State MICHIGAN

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
SOYBEANS	372	15,632	16	667	16	667	416	Ryegrass in corn	197
WHITE BEANS	786	8,858	16	180			802	Clover w/sm. grain	231
FIELD CORN	419	36,613	14	1,035	230	19,957	663	Wheat/rye/oats	456
BLACK TURTLE BEANS	74	1,096					74	Winter wheat	109
KIDNEY BEANS	51	491					51		
SORGHUM					32	1,280	32		
BUCKWHEAT					296	14,800	296		
WHEAT	75	2,546			45	1,485	120		
BARLEY	50	955			236	11,800	286		
OATS	38	2,500			9	540	47	Fallow Ag. Land	0
SUGAR BEETS	158	3,397			28	616	186		

No. of Permittees: Agricultural Operations 17 Haying Operations 1 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
ALFALFA	30.05	30	$210.35	1. Cattle				
				2. Other				
				1. Total Refuge Acreage Under Cultivation				2,992
Hay - Wild				2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C.91767

3-1570
NR-8a
(4/54)

REFUGE GRAIN REPORT

Refuge Shiawassee Months of May through December, 1970

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Shelled Corn	890	1,035	1,925	588	-	500	1088	833		113	720

(8) Indicate shipping or collection points

(9) Grain is stored at Refuge secondary headquarters granary (113 bu.) and 720 bu. Birch Run Elevator

(10) Remarks Surplus for transfer to Seney Refuge and Ottawa Refuge

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge Shiawassee Year 1970

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Szepanski Saw Mills, Inc.	70-2-T	Pool 3	300	All merchantable timber	Lump Sum	$16,000	None	Bottom land Hardwoods

Total acreage cut over 300 Total income $16,000.00

No. of units removed B. F. Method of slash disposal No special requirements

Cords

Ties

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Shiawassee

Proposal Number:

Reporting Year: 1970

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
June 18 to July 22	Willow, Cottomwood, Canada Thistle, and Nettles	Dikes, road ditches, drainage ditches and ditch banks	18	2,4-D	36	2 lbs/Acre	Water 3 pts. chemical per 125 gals.	Truck mounted broadjet sprayer

10. Summary of results (continue on reverse side, if necessary) 10% kill on all target species

35500

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Shiawassee MONTHS OF September TO December, 19 70

(1) Species	(2) Weeks of reporting period 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production Broods seen	(4) Production Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	15,000	18,000	20,000	25,000	14,500	5,000	5,000	4,000	1,622,530	-	-
Cackling											
Brant											
White-fronted											
Snow	10	10	10	10					574		
Blue	50	50	50	50					4,676		
Other											
Ducks:											
Mallard	45,000	45,000	60,000	60,000	20,000	7,000	1,000	1,000	3,913,000		
Black	5,000	5,000	6,000	6,000	2,000	1,000	500	500	351,400		
Gadwall											
Baldpate	50	50							6,300		
Pintail	50	50							15,820		
Green-winged teal	30	30	20						10,290		
Blue-winged teal	40	40	40						55,440		
Cinnamon teal											
Shoveler											
Wood	50	50	20	20					36,680		
Redhead											
Ring-necked											
Canvasback											
Scaup			20						140		
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coots:	100	100	50	50					26,600		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	0		
Geese	1,627,780	25,000	
Ducks	4,389,070	66,130	
Coots	26,600	500	

SUMMARY

Principal feeding areas Farm Units 1 & 8

Principal nesting areas

Reported by Refuge Personnel

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Shiawassee MONTHS OF September TO December, 19 70

(1) Species	Weeks of (2) reporting period									
	1 9/1-5	2 9/6-12	3 9/13-19	4 9/20-26	5 9/27-10/3	6 10/4-10	7 10/11-17	8 10/18-24	9 10/25-31	10 11/1-7
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	2,000	2,000	2.500	3,000	15,000	18,300	7,500	7,500	15,490	16,000
Cackling										
Brant										
White-fronted										
Snow					4	4	4	10	10	10
Blue					26	26	26	190	100	100
Other										
Ducks:										
Mallard	12,000	20,000	25,000	28,000	45,000	45,000	40,000	25,000	35,000	45,000
Black	800	1,000	1,200	1,200	3,000	3,000	3,000	2,000	4,000	5,000
Gadwall										
Baldpate		50	100	300	-	100	100	50	50	50
Pintail		10	50	100	200	200	200	100	300	1,000
Green-winged teal	100	100	200	200	500	100	30	30	30	100
Blue-winged teal	1,000	1,000	1,200	1,200	1,500	1,000	500	200	100	100
Cinnamon teal										
Shoveler										
Wood	500	500	500	500	500	1,000=	500	500	200	400
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:	500	500	500	500	400	500	200	100	200	100

Int. Dup. Sec., Wash., D.C. 37944

Shiawassee National Wildlife Refuge

Annual Narrative Report

1970

PERSONNEL

John R. Frye	-	Refuge Manager
Gaylord J. Bober	-	Refuge Manager (EOD 02-24-70)
S. Sam Poma	-	Refuge Clerk
Louis D. Robinson	-	Biological Technician (Resigned 12-18-70)
Lawrence J. Blazo	-	Engineering Equipment Operator
Kenneth H. Shelley	-	Medium Equipment Operator

TEMPORARY PERSONNEL

Thomas J. Niebauer	-	Biological Technician (Wildlife)
Lott Rolfe III	-	Soil Conservation Technician (Wildlife)
Kenneth B. Gillmore	-	Laborer

NEIGHBORHOOD YOUTH CORPS PERSONNEL

Hubert Baker	-	Laborer
Alton M. Nelson	-	Laborer
Kennard Peoples	-	Laborer
Gwen Hamilton	-	Office Helper

United States Department of the Interior

Fish and Wildlife Service

Bureau of Sport Fisheries and Wildlife

Shiawassee National Wildlife Refuge
6975 Mower Road
Saginaw, Michigan 48601

CONTENTS

I. GENERAL

A. Weather Conditions - 1970

	Precipitation				Max.	Min.
	Month	Normal	Snowfall		Temp.	Temp.
January	.95	1.11	9.8		46	-8
February	.58	1.76	2.9		49	-7
March	2.22	1.28	12.0		54	10
April	2.05	3.35	8.0		85	20
May	3.39	3.08	-		88	29
June	4.09	3.89	-		95	40
July	2.76	3.56	-		94	49
August	1.89	2.74	-		90	49
September	4.84	2.39	-		89	32
October	3.28	3.54	-		81	28
November	2.21	3.93	-		62	17
December	2.21	1.75	16.8		65	-8
Annual Totals	30.47	32.38	49.5	Extremes	95	-8

The year started out white and cold, January had snowfall on 16 days and 9 days with below zero temperatures. February, March, and April had below normal temperatures and precipitation. There was no major flooding, and our cooperating farmers were able to plant their crops on time and according to the agreements.

May and June received above normal amounts of rainfall, but the rains didn't start until after the middle of May, not interfering with the farming program. The summer was typical for Michigan; hot, humid days with periods of rain. July and August received 1.64 inches below normal rainfall, but September made up the lack with a surplus of 2.45 inches of rain over the average. September rains delayed the harvest of white beans and made it appear that we would never get the goose hunting blinds set up for the October 1 opening.

October and November, while below normal in the amount of precipitation, saw the period of time over which the rains came stretched into weeks so that the soil never quite dried out. The refuge staff, cooperating farmers, and hunters were continually walking in ankle deep or deeper mud.

The month of December started dry and warm until the 10th when 12 inches of snow fell. At the end of the year there were 10 inches of snow on the ground and the soil was well saturated with water.

B. Habitat Conditions.

1. Water. Throughout the winter Pools 1B and 2 were held near approved elevations, Pool 1A was nearly dry at times as the water level fluctuated with the river level due to the break in the dike. Pool 3 was kept dry throughout the year because of a logging contract in effect for the removal of all merchantable timber from this pool.

There was no major flooding this spring as the thaw was gradual and precipitation failed to exceed the drainage capability of the area. The major spring thaw occurred on March 1 and 2 and all rivers reached minor flood stage soon after. The only area on the refuge to flood was the southeast corner of the refuge (Pool 5 area). This area may not have flooded if the Spaulding Drain had been free flowing. The drain had several log jams in it at the time.

The water elevation in Pool 1A was not manageable until August when the contractor repaired the break in the dike. At this time the pool was drained to allow flood damage work to proceed. Pool 1B was brought to approved elevation in March and April when the rivers were high enough to feed water into the pool through the structure. The pool was held at the approved elevation until mid-July when it was drained so the contractor could start work.

Water from the river flowed over the dikes into Pool 2 several times in the spring during periods of high water. We were able to hold the pool at or near approved elevation during the year with no pumping. No manipulation of the water level took place due to the dike reconstruction under the flood damage contract.

Field water was nearly ideal in the spring with Farm Units 1, 2a, 3 and 2f having some surface water. These areas proved to be very attractive to the spring migrants as feeding areas. Field water was removed by pumping which commenced the first week of April and spring planting was carried out on time. In the fall, field water was very attractive to waterfowl once again. The farmers disagreed with the waterfowl on this point and pumped the water in order that the harvest could muck forth.

The river marshes were in good shape throughout the year and furnished excellent waterfowl habitat. The river marshes are primarily used by migrants and receive little or no use by summer resident waterfowl and their broods. This may be due to the fluctuating water levels, the result of wind tides that arise in the Saginaw Bay and runoff.

This fall Pools 1 and 3 were dry and the only available water was in Pool 2 and the rivers. Geese used the river as their primary loafing area and ducks concentrated in the Pool 2 area at this time.

In summation, forgetting harvest difficulties, if the pools had been manageable this would have been a near ideal water year with no flooding and near the normal precipitation.

2. Food and Cover.

Food and cover conditions in 1970 were excellent for all wildlife species. Spring migrants found ample food in the crop fields on the refuge. There was a plentiful supply of flooded corn in Farm Units 1 and 3 which was the refuge's share of the 1969 crop that had been knocked down over the winter. Farm Unit 2A was flooded by using water from the Eastwood drain. This farm unit contained 35 acres of corn stubble, 20 acres of unharvested corn, 20 acres of unharvested barley and 20 acres of winter wheat. It was not uncommon to find the entire population of migrant waterfowl in this field each morning during the first half of April.

Food and cover in the pools ranged from excellent to poor. Pool 1 had a good mixture of open water and emergent vegetation and was the pool used most by Canada Geese for resting and nesting until drained for construction in late June. Pool 2 was in excellent shape throughout the summer and fall with dense stands of cattail, interspersed with areas of open water and good growth of bladderwort. This pool produced 300+ young Coot. Pool 3, with no water control structure, has water only in an old bayou contained within the dike system. This is the only area which received use in the pool and had a thick covering of duckweed.

The summer population of Canada Geese including 310 goslings made heavy use of a barley field in Farm Unit 1A and completely ate out approximately 5 acres.

The refuge share of the 1970 crop that was left in the fields consisted of 22 acres of soybeans, 244 acres of corn, 32 acres of sorgum, 52 acres of wheat, 250 acres of barley, 296 acres of buckwheat, 28 acres of sugar beets, and 9 acres of oats. An additional 874 acres was seeded to browse, primarily wheat and rye. Migrant waterfowl made heavy use of these crops in the late summer and fall, except for the refuge share of corn and sorghum which will be knocked down this winter to provide spring food. Winter wheat and sugar beets located in the center of the refuge received heavy use in November and the first part of December. The same crops located on the edge of the refuge and surrounding private land received little or no use.

II. WILDLIFE

A. Migratory Birds.

1. Whistling Swans. The first spring migrants were observed on March 13 in the Shiawassee River. Four were present on March 17 and by the first week of April we reached our peak population

of 4,000 swans. The areas receiving heavy feeding use were flooded corn fields in Farm Units 1, 2a, and 3. The birds also spent a great deal of time resting and loafing in the Pool 1B area. Eleven neck-banded swans were observed this spring, most had been banded in the Chesapeake Bay area.

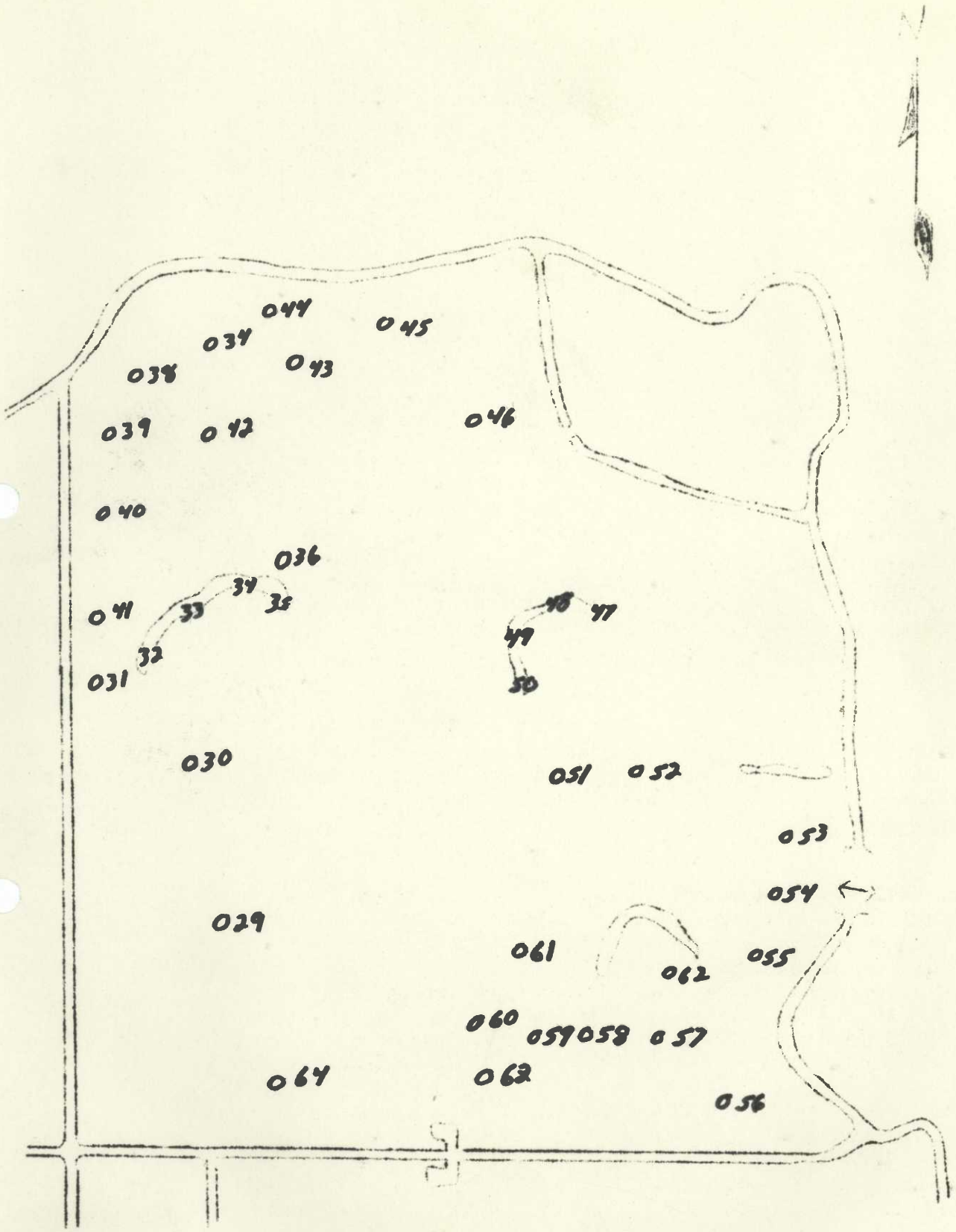
The swans began leaving about April 12 and by April 25 there were only 18 swans on the refuge. The last swans were seen on May 16. The fall migration was normal in that we received little use by swans. Several birds were reported by hunters the second week of November but no swans were observed by refuge personnel this fall. Total swan use days for 1970 were 74,095.

2. Geese. For the first time in several years there were no Canada Geese using the refuge at the start of the year. The first 17 spring migrants were sighted on February 24 about two weeks earlier than normal. There was a steady influx of geese from March 1 to 7. A major movement took place on the 6th and 7th, with an estimated 8,000 geese present on the 6th and 12,000 geese by the 7th. The peak population of 30,000 Canada geese were on the refuge from April 5th to the 17th. They used all available crops as food and loafed in the Shiawassee River and Pool 1 area. A mass exodus occurred between April 17th and 25th when the majority of the migrants left and only 1,000 resident geese remained.

Six Snow and Blue Geese were observed flying low over the Shiawassee River on the 7th of April for the first observation this year. The peak spring population of 22 Snow and Blue geese were using the area during the 3rd week of April, after which they moved on north. There were no reported observations of White-fronted geese during the spring migration.

The first pre-nesting activity was observed during the first week of March with the peak activity occuring about the end of the month. Due to the fact that the migrant geese spend a great share of their time loafing on the nesting islands in Pool 1, where the majority of the resident flock establishes territories and nests, strife between nesters and migrants may be a limiting factor in goose production on the refuge. There is presently no means by which this conflict of uses can be resolved.

The annual nest census was conducted on April 27 and a re-check made on May 27. A total of 72 nests was located, 39 in Pool 1A, 29 in Pool 1B, 4 in Pool 2, and 1 along the nature trail. The 72 nests contained 354 eggs for an average clutch size of 5.05. The majority of the nests were on man made islands as shown in the following table.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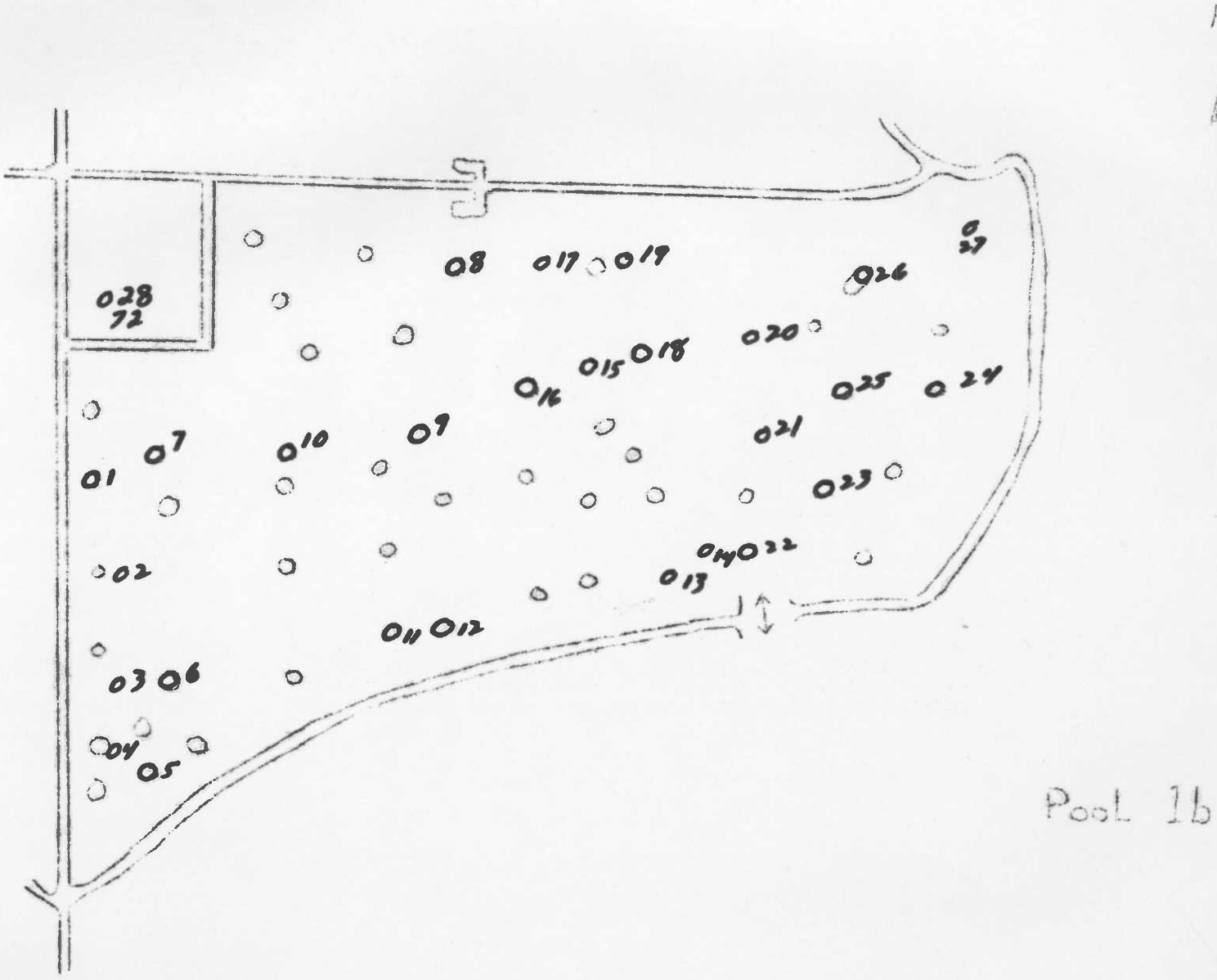
Pool 1A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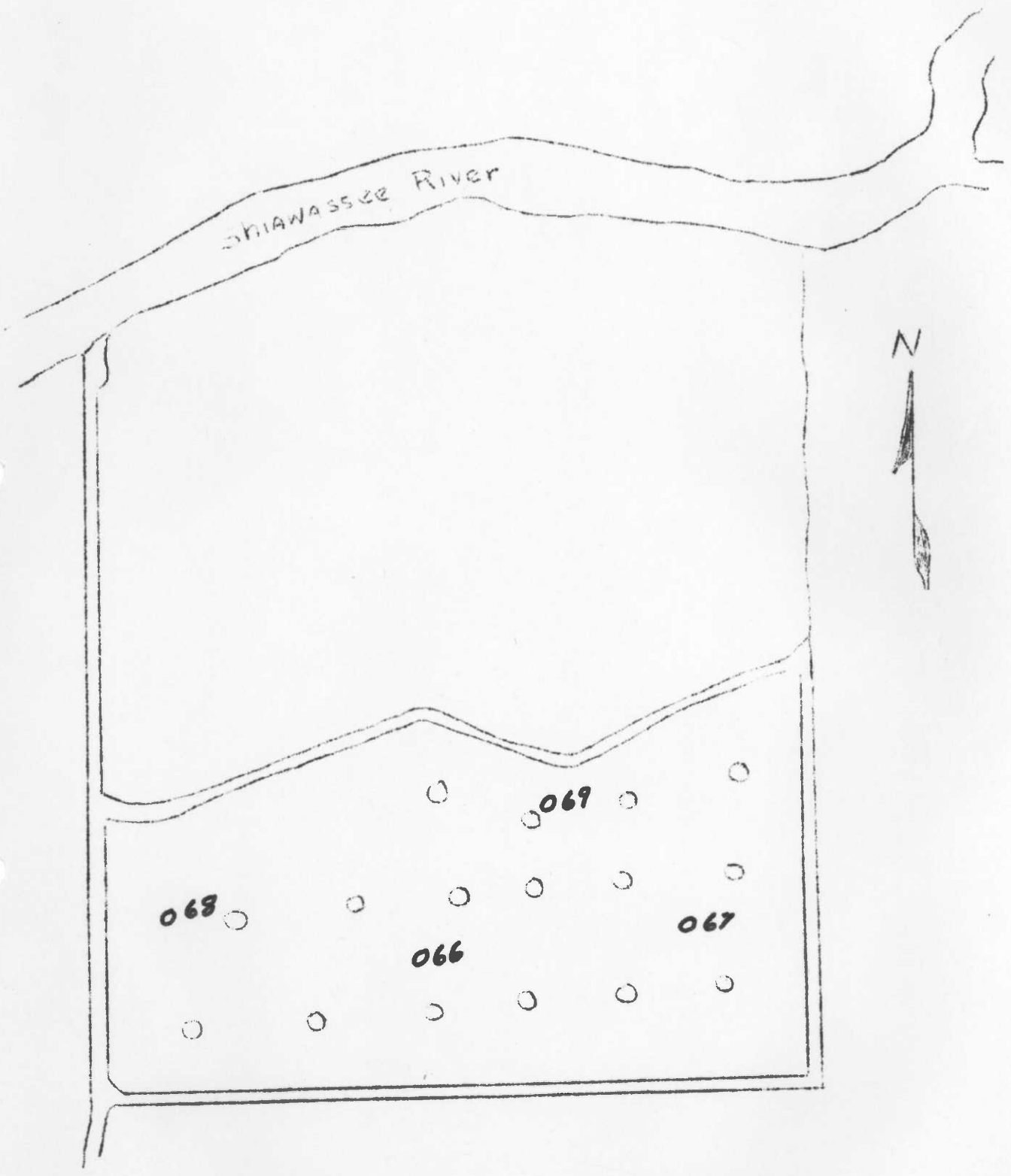
Pool 1b



Pool 2

LOCATION OF GOOSE NESTS - 1970

	ISLANDS 75.1%	NEST TUB 5.6%	MUSKRAT HOUSE 16.7%	OTHER 2.6%
Pool 1A	29	0	7	1
Pool 1B	25	4	1	0
Pool 2	0	0	4	0
Other	0	0	0	1
Totals:	54	4	12	2

HATCHING SUCCESS FOR 1970

	Total Eggs 100%	Hatched 88.2%	Sterile 5.1%	Destroyed 5.1%	Dead Embryo 1.6%	Total Not Hatched 11.8%
Pool 1A	175	149	17	4	5	26
Pool 1B	154	143	1	9	1	11
Pool 2	20	20	0	0	0	0
Other	5	0	0	5	0	5
Totals:	354	312	18	18	6	42

The first goose broods were observed May 6 and peak hatching occurred May 12 to 18. This year there were no natural (weather) factors observed which would curtail the nesting success. Some of the eggs listed above as sterile were the result of deserted nests. The high percent of hatched eggs can be attributed to the fact that most of the nests are located on islands relatively inaccessible to predators.

The goslings were drive-trapped on June 18 with 92 being banded and again on June 25, with 111 being banded for a total of 203, approximately 65.0% of the total goslings produced.

The first fall movement into the refuge occurred during the first week of September with the arrival of 1,000 geese. The next movement took place the first week of October when the population jumped to 15,000 and by October 10 there were 18,300 geese. The population decreased to 7,500 by October 14. From October 14 on there was a gradual build-up which reached its peak December 1 at 25,000 geese, and then an exodus before and during the first good snow storm on December 10. By the third week of December the population was down to 5,000.

Snow and Blue Geese made their first fall appearance the last week of October, reached a peak of 200 birds the period of November 18 to 24, and gradually left with the last 60 being observed during the second week of December. This was a drastic decrease is use from the peak fall population of 7,000 in 1969. The Michigan Department of Natural Resources reported a large movement of geese

about the first of November at a radar station located at Sault Ste. Marie, Michigan. There were no observations of the birds later anywhere in the state so apparently they overflew the state.

The total goose use days for 1970 were 3,028,928. This was up sightly from the 2,913,515 of 1969. There were still 4,000 geese on the area at the end of 1970 but no open water.

3. Ducks. There were no ducks using the refuge at the start of the year. The first spring migrants were sighted on March 4, when 11 Mallards and 3 Pintails were seen feeding in a corn field located in Farm Unit 1b. They were followed by 4 Wood ducks and 7 Common Mergansers on March 12. The first divers were seen on the 24th when 30 Goldeneyes, 3 Canvasbacks and 2 Redheads were spotted on the Shiawassee River. By the last week of March all common species except Teal and Ruddy ducks had made their spring appearance. Teal and Ruddy ducks were present by April 14.

The peak of the spring population was reached the third week of April when 12,500 ducks were using the refuge. This figure is lower than the 26,000 of last year and may be due in some extent to the fact the peak Pintail population occurred a week before the peak Mallard population. The last of April saw a major movement of ducks and the population had decreased to approximately 1,600 summer residents by the second week of May.

The first brood, 7 Hooded Mergansers, was sighted June 1 by the refuge manager. This was the first Hooded Merganser brood recorded on the refuge in the seven years that the manager has been here. There were an estimated 260 ducklings produced and 200 Coot. The figures are based on sightings and a summer banding program carried out by the student aid.

The summer population of non-nesting Mallards was erratic much of the time. During May there were 600 present, during the second week of June the population jumped to 3,000 and by the third week of June, 4,000 were present. By the second week of July the Mallard population had decreased to 2,000. From this point in time the population increased every week until the peak population of 45,000 was reached on November 7. The population decreased steadily from this point with only 100+ present at the end of December.

The total duck use days for 1970 was 5,405,005 with peak fall population of 66,130. Over 75% of this was made up of Mallards.

4. Coots and Gallinules. The first Coots were observed during the second week of March. By the third week of April the entire summer population of 300 birds was present. Production was estimated at 200, all of it in Pool 2. It was common to see seven or more broods in a trip around the pool. There was no buildup in the fall, which appears to be common for the refuge.

   Common Gallinules were first sighted the last week of April in Pool 2. By careful observation several could be seen throughout the summer. Some production does take place but no figures are available. The last Gallinule was seen the second week of October.

5. Other Water Birds. The arrival of these birds was spread over an extended period of time, commencing with the sighting of four Great Blue Herons on March 27, and ending on May 5 when a single Black-Crowned Night Heron was seen. American Bitterns, Pied-billed Grebes and Sora Rails were seen quite often in the latter part of April. Common Egrets were present during August and September with a peak population of twenty. One Snowy Egret was present for a week during August, and thirty plus Black Crowned Night Herons the latter part of August. The last sighting of Great Blue Herons was December 6th when three were seen along the Shiawassee River north of Pool 1.

6. Shorebirds, Gulls and Terns. The first Wilson's Snipe was seen on April 7th. Yellow-legs, Dowitchers, Killdeers, Spotted Sandpipers, and other unidentified "peeps" were seen throughout the month of April. Over 200 Dowitchers were using a mud bar in Pool 1A on May 18. This was the peak of the spring. Common Terns and Black Terns made their appearance early in May. The fall migration peaked in mid-September and most shorebirds had departed by mid-October.

   Herring Gulls and Ring-billed Gulls use the refuge the year around with their numbers being highest during prolonged windy periods.

B. Upland Game Birds.

Ring-necked Pheasants are few in number on the refuge, three were heard crowing in the past year. There has been a general decline in Pheasants state wide. The Michigan Department of Natural Resources is presently carrying out a great amount of research to find an answer to the question and to satisfy the public.

Mourning Doves are found throughout the year. The peak fall population was approximately 200 during the month of September.

C. Big Game Animals.

The White-tailed Deer on the refuge number from 600 to 800, with the herd spread over the entire area. The deer failed to form herds in the crop fields during February and March for the first time in several years. The first fawn was sighted on May 19 and fawns were commonly sighted throughout the rest of the spring and summer.

D. Fur Animals, Predators, Rodents and Other Mammals.

The muskrat population is at a high level on the refuge, with some redistribution of high concentration areas due to the fact Pool 1 is dry. Dike damage continues to be a problem with an ever increasing number of new dens being dug into the dikes. Presently there are three permittees trapping muskrats on the refuge. Pool 2 continues to receive benefit from the high population of rats as they are opening dense stands of cattail creating a more diversified habitat for waterfowl.

Beaver are still protected in this part of the state but will be trapped on the refuge in the spring of 1971 as part of a special state trapping area. There are at least seven active lodges at the present time. The beaver continue to cause problems by damming interior drainage ditches and by falling trees over patrol roads. All through the fall there has been an extremely busy beaver crew in the Eastwood drain with many trees down and over 40 cottonwoods ready to fall at any time.

Mink and Weasel remain stable, at a very low level with no signtings in the past year.

Raccoons are present and appear to be increasing.

Skunks are present and reports from the trappers indicate an increase in the population over the last year.

Red foxes are present in very high numbers and early most mornings in the past year it was not uncommon to see six or more of these creatures in their daily hunting activities. The refuge staff feels that their presence (the fox) create no problem but serve as an efficient means by which wounded and sick are removed from other wildlife populations. Fox fur continues to bring a good price and our permittee trappers make a mighty effort to trap as many as possible.

E. Hawks, Eagles, Owls, and Crows.

Sparrow hawks and American Rough-legged hawks are common residents during the winter and are frequently observed. Marsh hawks, Red-tailed hawks and Turkey vultures are summer residents of the refuge and the surrounding area. The first Marsh hawk and Red-tailed were sighted March 3rd. April 4th the first Turkey vulture of the year was spotted.

Bald Eagles made their first appearance June 6th when one adult and one immature were sighted. They were seen off and on until the first of December. It is unknown if the two eagles using the area over the six month period were the same two for the entire period.

One Osprey was sighted during the year. The bird was seen May 19 perched on a power pole in Farm Unit 1C eating a carp.

Great horned owls, short-eared owls, long-eared owls and screech owls are resident species of the refuge, seldom observed, but heard quite often.

Crows are year around residents of the refuge and the peak population of approximately 100 appeared in the months of September and March.

F. Other Birds.

Redwings arrived on March 6th and remained all summer. On April 6th the first Kingfisher and Tree swallows were observed over Pool 1B. No unusual observations were made this past year.

G. Fish.

Carp are found as the primary fish in refuge pools and in the rivers that flow through the area. There was a winter kill this past spring in Pool 1. This smelly problem will not be with us next year as the pool is presently dry for construction purposes.

H. Reptiles and Amphibians.

The refuge has a good population of non-poisonous snakes and all the common turtles of the area. The first turtle, a Blandings and the first snake, a Red-belly water snake were seen on April 5th. The snakes found on the dike around the goose pen during the spring make a big impression on school groups from the inner city area of Saginaw. One group was impressed to the panic point by a 5½ foot fox snake that swan up to the base of the dike they were standing on to observe waterfowl.

I. Disease.

Several swans were found dead this spring. There are usually several swans that die on the refuge each spring as the result of lead poisoning. They apparently pick up the lead on the wintering ground or in the migration.

J. Rare and Endangered Species.

None use the Shiawassee National Wildlife Refuge.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

1. Several contracts were awarded in the last year as follows.

   a. Two contracts were let in the past year and work started at long last on flood damage repairs. The contracts call for the building of approximately 15,000 feet of dike, rebuilding of 23,000 feet of existing dike, gravelling of 4½ miles of roads and dike tops, construction of one concrete water control structure, eight corrugated metal water control structures, three corrugated metal outlet structures, and the construction of three emergency spillways. Both of the contracts were awarded to Fondessy Enterprises, Inc. of Oregon, Ohio, at a bid of $282,895 for both contracts. When this work is complete we will have complete control of water in Pools 1 and 2, but will still require near flood conditions in order to place water in Pools 3 and 4.

   b. Bid invitations had been sent out for land clearing that needed to be done before work could start on the above contract construction job. The bids on this work were too high and the contract was not awarded. This clearing was made part of an add-work order negotiated with Fondessy Enterprises, Inc. Under this add order, several log jams in the Spaulding Drain were removed (beaver dams was the term used by Engineering). This work included clearing of all trees, including many dead Elms, from both sides of the Spaulding Drain to prevent future log jams in the drain inside the refuge.

   c. A contract was awarded to rechannel a portion of the Spaulding Drain. Due to the size of the log jam in this section of the drain it was easier and more economical to go around it rather than through it. The Spaulding Drain runs north from the Flint River and connects with the Ferguson Bayou. The drain carries 50% or more of the water in the Flint River during periods of high water. The Spaulding Drain has over 60% of its length contained within the refuge; when it floods, the refuge usually is the only area concerned and we were unable to obtain any service from the County Drain Commissioner.

   d. Four pit-type toilets were built at a total cost of $1,740. This was a fantastic buy and included all work except landscaping and painting. The painting and landscaping will be done next spring by refuge personnel. Two of the toilets are located near the main gate, and one each at the two picnic areas on the refuge.

2. Dikes and Ditches.

The refuge staff accomplished the following.

a. The reseeding of the Riverside dike top to ladino clover.

b. The reshaping of the dike along the east side of Pool 1B and seed it to ladino clover.

c. The raising of the dike along the west side of Pool 1A to elevation 590.00.

d. The clean-out of several interior farm ditches in Farm Units 1b, 1c and 11d to bring the ditches to grade, so that the field tile could function correctly.

e. A new tube and gate were placed in the dike between Farm Unit 2A and the Eastwood drain. This allows us to flood this farm unit when the drain is full.

3. Roads and Trails.

a. The nature trail received a major face-lifting this spring with the re-routing of traffic, new signs and removal of many dead trees which had fallen across the trail during winter.

b. All roads were graded this spring and thereafter as required.

c. Evon, Houlihan and Littlejohn roads were completely re-shaped before the contractor placed gravel on them.

d. All trails used during patrol work in the deer season were mowed in October.

4. Fencing and Posting.

a. During the year the refuge boundary signs were replaced as needed, some several times, as the "Great American Sportsman" continues to bag the flying blue goose.

b. The entire refuge boundary was checked and posted prior to the hunting seasons, before November 15 Area Closed signs were placed around the area closed to deer hunting with gun. Prior to December 1 Hunting by Permit Only signs were placed around the entire refuge.

c. The Lake St. Clair refuge and Wyandotte refuge were posted prior to the opening of waterfowl season and the buoys were picked up after the close of the season.

d. Boundary fence was repaired throughout the year. On the north side of the refuge the same section was repaired several times.

5. Miscellaneous Jobs.

Regular housekeeping chores occupied much of our time. These include painting of buildings, lawn mowing, vehicle maintenance, hauling over 30 loads of dirt to fill in the spots in the headquarters lawn, and more. A gasoline pump was installed at secondary headquarters, and the buildings in the area received a major cleaning.

Refuge personnel assisted R.O. Engineering people with survey work for flood damage repair contract information several times during the year.

The picnic area at the end of Evon Road was completed and area seeded. A primitive walk-in type picnic area was developed along the nature trail, at a distance of $1\frac{1}{4}$ mile from the parking area.

Barriers were constructed at two sites along the nature trail and three sites at the end of the spring auto-tour route to assist in the control of our human visitors.

The farm pump used to pump the field and tile water from Farm Unit 5 was relocated and converted to electric power with automatic controls.

Fifteen pits were dug and concrete vaults (bottom half of septic tank with drain hole) were installed to be used as blinds in the managed goose hunting program.

B. Plantings.

1. Aquatic and Marsh Plants.

None.

2. Trees and Shrubs.

None.

3. Upland Herbaceous Plants.

None.

4. Cultivated Crops.

Eleven different crops were grown on 2,972 acres of refuge farm land. All farming was carried out under Cooperative Farming Agreements with local farmers. The farmers furnished all materials and performed all the work in the farming program. Refuge crops and yields are summarized in the following tables and on the NR 8. The eleven crops grown were Soybeans, White beans, Black Turtle beans, Kidney beans, Corn, Sorghum, Buckwheat, Wheat, Barley, Oats, and Sugar beets.

SHIAWASSEE NATIONAL WILDLIFE REFUGE

REFUGE CROPS - 1970

CROP	TOTAL ACREAGE	% OF TOTAL	AVE. YIELD	AVE. VALUE
WHEAT	121	4.1	34	$ 43.34
BARLEY	286	9.6	19	15.66
CORN	663	22.3	87	113.67
WHITE BEANS *	927	31.1	11	85.08
SOYBEANS	416	14.0	42	112.86
BUCKWHEAT	296	10.0	NOT HARVESTED	-
SORGHUM	32	1.1	NOT HARVESTED	-
OATS	47	1.6	66	NOT SOLD
SUGAR BEETS	186	6.2	22	195.65
TOTALS:	2,974	100.0	--	$100.14 (AVE.)

* INCLUDES 51 ACRES KIDNEY BEANS AND 74 ACRES BLACK TURTLE BEANS

CROP YIELDS - 1970

BARLEY

COOPERATOR	ACRES	BU/ACRE	$/ACRE
ALMY, I.	6	NOT HARVESTED	
BOESE, M.	49	NOT HARVESTED	
BOWDEN BROTHERS	73	14.1	9.78
BREMER, G.	20	NOT HARVESTED	
BRUNS, J.	22	30.8	29.26
GOSEN, H.	24	NOT HARVESTED	
PEAPHON, A.	40	NOT HARVESTED	
SCHLUCKEBIER, A.	52	NOT HARVESTED	
TOTALS:	286	19.1 ave.	$ 15.66 ave.

WHEAT

COOPERATOR	AVRES	BU/ACRE	$/ACRE
ALMY, I.	17	NOT HARVESTED	
BOWDEN BROTHERS	15	22.1	28.51
BREMER, G.	44	33.4	43.12
PAGEL, C.	28	40.5	52.65
PEAPHON, A.	12	50.0	NOT SOLD
WEIGL, R.	5	NOT HARVESTED	
TOTALS:	121	33.6 ave.	$ 43.34 ave.

CROP YIELDS - 1970

WHITE BEANS

COOPERATOR	ACRES	CWT/ACRE	$/ACRE
ALMY, I.	134	9.44	80.05
BENKERT BROTHERS	32	4.78	35.23
BOESE, M.	110	15.74	137.88
BOWDEN BROTHERS *	51	9.63	65.10
GOSEN, C.	79	11.4	79.80
HART, M.	63	9.0	71.81
PAGEL, C.	42	10.77	99.62
PEAPHON, A.	16	12.23	105.06
PEAPHON, A. **	74	14.81	96.24
SCHLUCKEBIER, A.	140	11.25	88.63
SCHRAMKE, C.	20	12.87	83.14
WEIGL, R.	10	5.8	44.43
TOTALS:	927	11.27 Ave.	85.08 Ave.

* KIDNEY BEANS ** BLACK TURTLE BEANS

SOYBEANS

COOPERATOR	ACRES	BU/ACRE	$/ACRE
BOWDEN BROTHERS	40	57.1	158.17
FAWCETT, H.	59	NOT HARVESTED	-
GEMPEL, J.	34	32.7	86.00
GOSEN, C.	56	44.0	110.00
GOSEN, H.	24	42.0	115.08
HART, M.	63	34.0	93.58
PEAPHON, A.	62	39.1	107.92
SCHRAMKE, C.	37	48.5	129.50
SCHREMS, G.	25	41.6	115.23
WEIGL, R.	17	37.6	104.15
TOTALS:	416	41.8 Ave.	112.86 Ave.

CROP YIELDS - 1970

CORN

COOPERATOR	ACRES	BU/ACRE	$/ACRE
ALMY, I.	102	77.3	NOT SOLD
BOESE, M.	147	105.0	148.05
BREMER, G.	90	75.3	102.34
BRUNS, J.	10	69.4	97.85
FAWCETT, H.	20	75.0	NOT SOLD
GEMPEL, J.	5	NOT HARVESTED	-
GOSEN, C.	86	NOT HARVESTED	-
GOSEN, H.	24	116.4	144.34
PEAPHON, A.	51	77.9	98.15
SCHLUCKEBIER, A.	108	86.2	112.06
SCHRAMKE, C.	20	55.2	70.59
TOTALS:	663	86.8 Ave.	$113.67 Ave.

SUGAR BEETS

COOPERATOR	ACRES	TONS/ACRE	$/ACRE
BREMER, G.	7	24.2	212.96
BRUNS, J.	10	16.6	154.60
GOSEN, C.	35	18.6	183.20
PEAPHON, A.	35	19.2	203.28
SCHLUCKEBIER, A.	94	22.5	199.75
SCHRAMKE, C.	5	NOT HARVESTED	-
TOTALS:	186	21.5 Ave.	$195.65

The first field work this spring was done on April 13. Planting proceeded on time and most crops were planted as per the agreements and not rained out for a change. Exceptions were a winter wheat field that was grazed out by geese and two fields of sugar beets which failed to germinate. The farmers were able to harvest their share of the barley and wheat with no difficulty. The rains and the bean harvest started at the same time and the farmers started a long hard fall. The beans had some blight and most developed root rot before they could be harvested due to the wet conditions. Corn and sugar beets were also difficult to harvest due to the wet conditions. The corn also had blight and much of it lodged before it could be combined.

The refuge share of the 1970 crops included 22 acres of soybeans, 244 acres of corn, 32 acres of sorghum, 296 acres of buckwheat, 27½ acres of sugar beets, 52 acres of wheat, 250 acres of barley and 9 acres of oats. Sixteen acres of the refuge share of corn was harvested and gave a yield of 1,125 bushels. Presently we have 739 bushel of corn stored at a local elevator for transfer to Seney and Ottawa Refuges. Transfer of 196 bushels of corn has been made to Ottawa Refuge already.

Winter wheat and rye were planted as green cover crops after the harvest on 874 acres of refuge farmland. This cover crop provides browse, prevents erosion, and serves as green manure in the spring, adding humus to the soil.

C. Collection and Receipts.

1. Animal Specimens. None collected in the past year.

2. Refuge Herbarium. No plants were added to the collection.

D. Control of Vegetation.

Weed control in the crop fields is accomplished by the cooperating farmers. The chemicals used in this program have all been approved by the Regional Office.

Some spraying was undertaken by the refuge staff along dikes and roads to control willow and thistle. 2,4-D was used to spray the 18 acres treated. Manual means (NYC's and axes) were used to remove saplings from two areas. The refuge staff also used mechanical weed control which consisted of mowing the road edges, dike tops and field borders several times during the summer.

E. Planned Burning. None.

F. Fires. None

IV. RESOURCE MANAGEMENT

A. Grazing.

None.

B. Haying.

One permit was in effect. Thirty acres were cut twice for a total yield of 30.05 ton that brought a total revenue of $210.35.

C. Fur Harvest.

The Michigan 1969-70 trapping season was from November 15, 1969 to January 31, 1970, but the refuge was given a special extension of the season through March 31, 1970. Three permittee trappers removed 1,396 muskrats, 33 fox, 9 raccoon, 8 oppossums, 5 skunk, 1 beaver, and 1 large black cat during the season. The permittee's sold the furs for the best price they could receive with the refuge getting 40% of the money received for the muskrat pelts. The three trappers received a total of $1,843.95 for the rat pelts, the refuge share of the fur harvest receipts was $737.58.

January 13, 1970 was a black day for permittee trapper Joe Bouchey. On that day he received a puncture wound on his thumb from the talon of the hawk he was removing from a trap. He had a tetanus shot that evening. The doctor had him start rabies' shots on January 15th. Public Health Service doctors said the hawk had probably caught mice which usually harbor rabies virus and there was a 1 in 5,000 chance he, Bouchey, might have been infected.

A sample of the muskrat pelts were aged and sexed prior to their sale. Results were as follows:

Adult		Immature	
Male	Female	Male	Female
40	39	50	55

From the sample, age and sex ratios were computed as 1 adult : 1.3 immature and 1 male : 1.04 female.

The general 1970-71 Michigan trapping season opened on November 15, 1970 and will close March 31, 1971 with a special season to be announced for the trapping of beaver in the spring of 1971. There are presently three permittee trappers on the refuge. Their take as of December 31, for the 70-71 season was 319 muskrat, 17 fox, 11 oppossum, 6 raccoon, 6 skunk, 2 cats, 1 badger and 1 dog.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Whistling Swans.

The formal wildlife management study was completed in the spring of 1968 and the formal report has been submitted.

The refuge has continued to trap swans in the spring, and to age, sex, dye, and band them with the standard F&WS band on one leg and a plastic band on the other leg. A yellow plastic band was also placed around the neck. We hope to gain additional information on the swans' life history. Also, the refuge has cooperated with a Dr. William Sladen, of The John Hopkins University, who is carrying out an intensive study of the migration habits of the swans. This spring 12 marked swans were sighted on the refuge. From the information received from Dr. Sladen it was evident that ten of the swans had been banded and/or dyed in the Chesapeake Bay area, the other two were from Utah.

Eleven sightings were made in 1970 of swans that had been marked at Shiawassee Refuge. The following table shows when and where.

Swan Observations 1970

Date	Number	Observation	Location
February 10	1	Band	Mattamuskeet NWR, N.C.
February 18	1	Neck band	Claiborne, Md.
March 24	1	Neck band	Lake Gorden, Pa.
April 19	1	Dye	Square Lake, Minn.
April 26	1	Dye	Riceton, Saskatchewan
April 27	1	Dye & neck band	Leonard, N.D.
May 1	1	Dye	Togish, Yukon
May 4	2	Dye	Rock Lake, N.D.
May 7	1	Dye	Munich, N.D.
May prior to 19	1	Dye	Creelman, Saskatchewan
October 22	1	Neck band	Cherry Lake, N.D.

This spring the birds were dyed red on the neck and breast, banded with the standard metal F&WS band, and yellow plastic bands were placed on the leg and neck. For the first time in this project the plastic bands were numbered. Numbers and bands were furnished by Dr. Sladen. From the observation we made on swans that his co-workers had banded, we can state that the bands are easy to read from a distance of one half mile with a spotting scope.

B. Marsh Transect Surveys.

This study was originally started back in 1956. In 1964 the study was cut in size and revised under the direction of Dr. William Green so that the information gathered would be more useful in the management of the vegetation in the pools. During August the student aid ran the nine line-intercept transects and the four other transects that contain a total of 36 quadrats. Color slides were taken and have been added to the transect slide file. All information gathered in this study during the summer was written up, the necessary graphs made and placed in the refuge files. In two to four years this study should be complete. A continuing problem has been the fluctuating water levels in the pools due to the lack of adequate controls. At the end of next summer this problem will be behind us and some of the gathered information will be put to work. Hopefully we will get the desired plant growth by using the water elevation information gathered in this long study.

C. Banding.

During the spring migration period 192 Canada geese and 15 Whistling swans were banded. The student aid spent much time and effort this past summer that yielded a total of 3 wood ducks, 18 mallards, 18 coots, 15 gallinules, and 5 blue-winged teal. More birds of the year have been banded in the past by student aids but this year the aid was hindered by dry pools and construction work. Also he displayed a common trait found in the young of today and, for the most part, only worked for the time he was paid. In the past youthful zest and the thirst for knowledge led to the pursuit of this project seven days a week with time out during the daylight hours only to complete other duties. This is not to say we wasn't eager; he did donate time but not as much as most students have in the past.

The late summer was a productive banding time for the refuge staff as a whole. In July, 203 goslings were banded. The early population, consisting of high numbers of mallards, made it fairly easy to band 598 mallards and 45 black ducks in August. The fall banding program is covered in depth by the enclosed report made by Gerald Cummings. A summation of the banding carried out in 1970 is given in the following table.

Regional Director
Twin Cities, Minnesota

November 24, 1970

Area Biologist, Chautauqua NWR
Havana, Illinois

Project Report - Cooperative Goose Banding Project - Shiawassee NWR, Michigan

SUMMARY

I first wish to commend Mr. Frye and his crew who were most cooperative and friendly under most strenuous conditions. These fellows were at the hunter check-in station at 4:00 a.m. every day of the week and many evenings the lights were burning in the office so they could keep up with the administrative duties of a busy refuge. The courteous and friendliness exhibited to hunters and visitors to the area during the month I was there was outstanding. I wish to make special reference to Gaylord Reber (Assistant Refuge Manager) whose enthusiasm and tireless effort made this project as successful as it was.

The goose banding project was initiated on a cooperative basis with the Mississippi Flyway Council in an attempt to further understand the migrational patterns of the Tennessee Valley Flock of the flyway. The project (I understand) was discussed at a council meeting in August involving Art Hawkins (Flyway Representative), Ed Nichols (State of Michigan Biologist), Earl Cunningham (Refuge Biologist, Region 4) and others. It was agreed that this would be a cooperative venture in banding and painting geese at Shiawassee NWR at Saginaw, Michigan.

I was informed a month prior to the project that I would assist Mr. Frye (Refuge Manager) in this banding effort. I was also notified that State personnel and Earl Cunningham (Biologist, Region 4) would be on hand to assist. I made the necessary contacts to line up rockets and nets with sufficient charges for them. The State was to furnish three set-ups and I borrowed one set-up from Chautauqua NWR - along with the two Dill-Miller set-ups at Shiawassee, we would have six complete cannon nets. A check on paint and equipment was made at this time and all preparations and commitments appeared to be ready to go.

I arrived on the area to commence trapping October 12, 1970, and was informed of the following:

1. The State had not delivered the rocket nets.
2. To the knowledge of the Refuge Manager, no State personnel had shown up or were any recent contacts made in regard to the project.
3. No trapping within a mile of a hunting area (this restricted us to 450 acres in the heart of the refuge).
4. No mowing of crop fields to prepare a site for trapping.

5. The two major pools on the refuge had been drained for construction purposes.
6. Construction crews would be active in the trapping area.
7. I would have one assistant from the refuge staff to carry out the project.

In addition to these, we had intermittent rain and unbelievable mud conditions throughout the period, an abundance of deer and fox on the area, geese that preferred browse due to exceptionally mild weather, and finally, the population of geese dropped from 18,300 to 7,500 in the middle of the project. I do not mean any of the above to be excuses but merely to set the picture in one's mind how a simple project can become quite complicated under the right circumstances.

We finally got two rocket net set-ups from the State on October 15 and a third one October 27. The following is a summary of the results of the operation.

DATE	No. Banded-Sex-Age				TOTAL BANDED	RECOVERIES		TOTAL CAUGHT	NUMBER PAINTED WHITE
	AHY M	AHY F	HY M	HY F		Foreign	Current		
Oct. 12	1	6	3	7	17			17	
13	10	11	9	10	40	6		46	
14	19	20	4	9	52	2		54	
15	7	15	6	7	35			35	7
16	27	23	8	18	76	15		91	
17	58	30	29	23	134	9	2	145	
18	18	16	14	18	66	3		69	
22	30	15	23	23	92	12		104	
23	8	6	7	11	34	2		36	
24	18	14	24	23	79	5		84	
Nov. 2	59	42	48	34	183	19	9	211	6
5	16	19	32	21	88	4	7	99	
6	25	28	15	14	82	16	11	109	
TOTAL	290	268	222	218	978	93	29	1,100	11

*The number painted was limited due to lack of help and the condition of the birds.

One interesting facet of this data is the high number (8.6%) of foreign retraps in the population. As indicated by Figure 1, both foreign retraps and normal retraps suggest a static population at the end of the project.

A breakdown of the personnel and man/days involved in the project follows:

PERSONNEL	DATES WORKED	HOURS	MAN/ DAYS
Daylord Bober (Asst. Refuge Mgr.)	October 11-November 5	136	1/2
G. E. Cummings (Reg. 3 Biologist)	October 11-21 October 27-November 5	252	31-1/2
Earl Cunningham (Reg. 4 Biologist)	October 27-November 5	110	11-3/4
Martin Pellack (State Mgt. Man)	October 26&27 (PM)	14	1-3/4
Frank Wojcsek (State Mgt. Man)	October 26 & 27 (PM)	14	1-3/4
Dick Elden (State Habitat Biologist)	October 28 & 29 (PM)	14	1-3/4
John Ransour (Bureau Engineer)	Estimated Intermittent Time	8	1
Jack Frye (Refuge Manager)	Estimated Intermittent Time	8	1
Louie Robinson (Biological Technician)	Estimated Intermittent Time	16	2
		788	98-1/2

In addition, Mr. Bud Johnson (State Biologist) and William Shakes (Wildlife Services) dropped by to observe the operation.

The data appears to reflect a lack of coordination between the cooperating agencies. Shiawassee Refuge personnel contributed almost 50% of the help in this project.

The project was terminated November 5 due to declining geese populations on the refuge, clearing weather which precipitated geese feeding off the refuge and not conducive to being trapped and finally, the economics involved in further efforts. I cleared the closing of the project with John Ellis and Art Hawkins was notified by Earl Cunningham.

Diary Report Attached: In addition to the above, I am including a daily record that I taped at the end of each day, merely as a more complete record of the project.

Recommendations:

1. A management plan should be written for this population segment of the flyway. With a plan, it is hoped that research needs basic to the welfare of the bird can be identified and pursued in an orderly manner.

2. The Flyway Council should consider a fall banding quota of 1-2,000 Canada geese at Shiawassee Refuge.

3. Any coordinating efforts in the Flyway should be documented in detail on a project work sheet well in advance of the anticipated field work. All cooperators should have a copy of this work sheet which would show their commitment to the project.

O. E. Cummings

Attachment

Waterfowl Banding - 1970

Species	Local Male	Local Female	HY Male	HY Female	AHY Male	AHY Female	Total
Blue-winged Teal	3	2	-	-	-	-	5
Black duck	-	-	4	10	21	10	45
Wood duck	2	1					3
Mallard	8	9	87	134	202	175	615
Total Ducks	13	12	91	144	223	185	668
Coot	5	1	-	-	-	-	6
Gallinule	3	7	-	-	-	-	10
Canada Goose	98	105	222	218	399	350	1392
Whistling Swan	-	-	-	-	8	7	15
Total	119	125	313	362	630	542	2091

D. Sugar Beet Utilization by Canada Geese.

The objectives of this study are to determine use patterns and food values received by wildlife, primarily Canada geese, from sugar beets. Also, all phases of the growing of beets that prove detrimental to the management of the refuge are to be documented, such as soil compaction and the rutting of refuge work roads.

The study this year was a repeat of the program carried out last year. This was due to a misunderstanding with one of the permittee farmers. This year the greatest percentage of sugar beets was to be planted in the perimeter fields and one field in the center of the refuge. The refuge share of the outlying fields was to be topped at the time of harvest, and left in the ground until the end of the goose hunting season at which time the beets were to be lifted and dumped on the surface of the ground. This part of the study was carried out correctly.

Our share of the beets in the center of the refuge, 10 acres, were to remain undisturbed. The entire 94 acres of beets in this area was topped at one time due to a misunderstanding with the permittee farmer. Thus, we were unable to discover if geese would feed on beets that were untouched by harvest operations once they had started to feed in harvested beet fields.

The sequence of events this fall for sugar beet harvest operations are as follows:

September 28. The first beets were harvested in the area, 1/2 to 3/4 mile east of the refuge.

September 29 and 30. Beets in the perimeter areas of the refuge topped (Farm Units 5, 9A, 9B, 9C and 9F). They received no use by geese.

October 4 - November 20. Greatest percent of beets on private lands harvested in the surrounding area. No observed use by geese.

November 5 - 12. Beets harvested in center of refuge (Farm Unit 1B) located between Pools 1 and 2. Little goose use prior to November 10, extensive use after this date.

November 15. Most of estimated 20,000 geese on the refuge were concentrated in Farm Unit 1B.

VI. PUBLIC RELATIONS

A. Recreational Use.

The location and facilities offered at Shiawassee Refuge are becoming known to more people each year. The demand to observe wildlife continues to increase and the non-hunter use and the hunter use of the area conflict. "What is a National Wildlife Refuge - define the word refuge", we are often asked this question and it can be tough.

Spring auto tours and use of the nature trail were higher this year than at any time in the past. Several of the local newspapers printed articles on spring migrants, the weekend auto tours, and the nature trail. This year on the auto tours, the public was allowed to come and go at their own speed. The people were met at the main gate by a staff member and given directions to the Pool 1 area. They were allowed to continue into the refuge at their own speed but required to stay in the vehicle until they reached the pool. At this point they were met by another staff member and allowed to leave their vehicles and look at the wildlife. In previous years, the auto tours were run 10 cars at a time and not all who wanted to were able to get in. The new method was a vast improvement.

Open House activities were held April 12-19 and included slide talks at refuge headquarters and auto tours. The refuge was visited by 5,950 people during the week. If funds and manpower were available the refuge could increase the non-hunter type of use 100 times what it is at present. The entire staff was tied up during the open house, the huge numbers of visitors requires constant observation to keep them (the public) and their vehicles under control. The limited public use facilities at Shiawassee make the people management problem much larger than it should be.

The use of the nature trail continues to increase each year. This year during a period of high water the entrance of the trail was under two to five feet of water but people would wade across and walk the

WELCOME

SHIAWASSEE NATIONAL WILDLIFE REFUGE

OPEN HOUSE

The Shiawassee National Wildlife Refuge, administered by the Bureau of Sport Fisheries and Wildlife, was established in 1953, and is an example of the restoration of wildlife habitat. Primary objectives of the refuge are to provide resting and feeding areas for peak migration populations of 40,000 Canada geese and 100,000 ducks during spring and fall months, and to provide nesting habitat for the annual production of 1,000 Canada geese and 4,000 ducks. Other objectives are to provide habitat for migratory birds other than waterfowl and resident wildlife species, and to provide for public recreation, when such public use does not conflict with the primary wildlife objectives.

Of the 8,857 acres included within the Shiawassee National Wildlife Refuge, croplands comprise nearly 3,000 acres and at the present time there are 600 acres in managed marshes or pools. When the refuge is fully developed there will be approximately 3,000 acres of croplands, 3,000 acres of managed marshes and pools, and 3,000 acres of woods and grasslands.

All refuge croplands are operated by local farmers under a share-cropping arrangement, with the cooperating farmer receiving two-thirds of the crop and the remaining one-third of the crop is left in the field to furnish food for all wildlife species. The refuge share of crops grown is generally taken in acreages of corn, wheat, barley, and buckwheat which are good wildlife food crops.

Maintenance and improvement of waterfowl habitat on refuge lands is accomplished through manipulation of water levels in the managed marshes. Nesting islands have been constructed in pool areas for use by Canada geese and ducks. Many of the islands are occupied by geese on their nests at the present time.

On your tour of major portions of the Shiawassee National Wildlife Refuge today you will have the opportunity to see large concentrations of migrant Whistling swans, Canada geese, and most of the common species of ducks. Less easily observed native animals that might be seen include deer, muskrats, red foxes, and beaver.

We suggest you take time to walk on our Wildlife Trails if you have a leisurely two hours to spend. Trail maps are available at the starting point of the trails, located at the end of Curtis Road, and trails are marked with directional arrows.

Your participation in either the automobile tour, or by a walk on the Wildlife Trails, should provide a positive answer to our theme for this open house, "Seen any wildlife lately".

trail even with "closed" signs up. Nearly 5,000 people walked the trail this past year. The trail was closed October 1 because of the hunting seasons and construction work in the area.

B. Refuge Visitors.

Date			Affiliation	Purpose
Jan.	13	Pat Fritz	Saginaw News Sport Editor	Feature article
	13	Dan Dranden	Saginaw News Feature Editor	Feature article
	30	Rick Bruggers	Grad. Student Bowling Gr. U.	Waterfowl studies
Mar.	18	A. Bartoszek	Panhandle Eastern	Pipeline easement
	18	R. Thurman	Panhandle Eastern	Pipeline easement
	18	R. Herrick	Panhandle Eastern	Pipeline easement
	30	Marc Wesley	WNEM-TV Announcer	Feature film
	30	Gene Little	Mich. Sportsman TV Show	Films
Apr.	9	D. D. Harptead	Mich. State University	Observe birds
	9	E. Everson	Mich. State University	Observe birds
	9	Max Nortland	Mich. State University	Observe birds
	9	C. Harrison	Mich. State University	Observe birds
	10	Gene Little	Mich. Sportsman TV Show	Films - Swans
	10	Howard Shelley	Mich. Sportsman TV Show	Films - Swans
	12	Bill Banting	Canadian Wildlife Service	Swan study
	12	Ray Schweinburg	John Hopkins University	Swan study
	13	Howard Shelley	Mich. Sportsman TV Show	Film goose banding
June	8	James Monnie	FWS, Refuges, Twin Cities	Recreation
	8	Ed Stevenson	FWS, Engineer,Twin Cities	Recreation
	8	Marv Duncan	FWS, Refuges, Twin Cities	Recreation
	22	Ralph Town	FWS, Lake Andes, S. D.	Visit
	22	John Ellis	FWS, Refuges, Twin Cities	Biological studies
	22	Dr. Wm. Green	FWS, Winona, Minnesota	Biological studies
	24	Art Swirtz	U. S. Attorney	Visit
Aug.	1	Harry Stiles	FWS, Refuges, Washington	Flood damage inspection
	25	Dr. H. Prince	M.S.U., Wildlife & Fisheries	Wood duck studies
Oct.	11	Jerry Cummings	FWS, Biologist, Region 3	Banding project
Nov.	7			
Oct.	19	Hilda Bechtold	Student Intern, FWS, R.O.	Great Lakes study
	21	Joe Ritchey	FWS, Eng., Twin Cities	Flood damage inspection
	26	James Monnie	FWS, Refuges, Twin Cities	Observe hunting program
	26	John Ellis	FWS, Refuges, Twin Cities	Observe hunting program
	27	Earl Cunningham	FWS, Biologist, Region 4	Banding Project
Nov.	7			
	5	A. O. Manke	FWS, Ottawa Refuge, Ohio	Observe hunting program
	6	J. Leonardson	FWS, Seney Refuge, Mich.	Green Trees Res.
Dec.	8	R. D. Young	State Representative	Tour
	21	D. Beeler	MDNR, Fire Officer	Fire Plan

Periodic visitors included USGMA's Cross and Fuchs, Michigan Conservation Officers John Harris and Harold Jerome, R.O. Engineer John Ramsour, and Cooperator farmers.

C. Refuge Participation.

1. Refuge Tours.

March

9 - Land Appraisers, Michigan Department of Natural Resources. (Poma & Robinson - 13)

April

4 - Midland Nature Club and Lansing Audubon Club. (Frye & Bober - 150)

6 - Mackinaw Middle School 6th Grade. (Frye - 30)

6 - Alma College Biology Class. (Bober - 18)

7 - Central Michigan University Orinothology Class. (Frye & Bober - 17)

9 - Munger School 3rd Grade. (Bober - 25)

9 - Chesaning School 3rd Grade. (Bober - 26)

10 - Jessie Loomis School 1st & 2nd Grades. (Bober - 54)

10 - Adult Activity Center - Mentally Retarded. (Robinson - 18)

10 - Child Guidance Clinic. (Frye - 8)

13 - Cub Scouts. (Bober - 32)

13 - Furbringer School. (Bober - 50)

14 - Cub Scouts. (Bober - 25)

16 - Au Gres Garden Club. (Poma - 30)

17 - Handley School 5th Grade. (Poma - 45)

17 - Regina High School Sr. Biology Class. (Poma - 18)

21 - Exchangettes Club. (Poma - 15)

23 - Jessie Loomis School 2nd Grade. (Bober - 52)

23 - Mahar School 1st, 2nd, 3rd Grades. (Bober & Frye 120)

24 - Trinity Lutheran School 7th & 8th Grades. (Bober - 26)

27 - Trinity Lutheran School 3rd & 4th Grades. (Poma - 25)

April 28 - St. Helens School. (Bober - 78)

28 - Chesaning School. (Bober - 40)

28 - Saginaw Police Cadets. (Bober - 50)

29 - St. Michaels School. (Poma - 65)

29 - Albee School. (Poma - 32)

29 - Saginaw Police Cadets. (Bober & Poma - 50)

May 5 - Cub Scouts. (Bober - 12)

7 - Buna Vista Schools 4th, 5th, 6th Grades. (Frye, Bober, Poma - 150)

19 - McBrite School 3rd Grade. (Bober - 50)

June 4 - Corunna School 6th Grade 4H. (Poma, Bober - 128)

2. Meetings.

January 28 - Annual meeting "Michigan Natural Resources Council" 29 and Governor's Conference on Urban Leisure at Wayne State University, Detroit. (Frye)

February 10 - "Keep Michigan Beautiful", Saginaw County Chapter - Luncheon Meeting. (Frye)

March 2-4 - District Managers Meeting, Madison, Wisconsin. (Frye)

10 - Central Michigan University Biology Department Head and Staff re: use of Gull Island for research on Gulls. (Frye)

30 - "Keep Michigan Beautiful", Saginaw County Chapter. (Poma)

April 19 - Michigan Canada Goose Ecology Seminar - Kellogg Bird 21 Sanctuary, Augusta. (Frye & Bober)

June 23 - With Michigan Department of Natural Resources re: Goose hunting programs. (Frye, Bober, Ellis, Green)

July 14 - State Farm Management Tour. (Rolf, Bober)

Periodically during the year Frye attended monthly meetings of the Saginaw County Agriculture Council, Spaulding Township Park Commission, and Frye continued to serve with the Spaulding Township Volunteer Fire Department. Poma continued to serve as Assistant Scoutmaster with his local troop.

3. Slide Talks.

January	19	- Mahar School PTA. (Frye - 39)
February	9	- Boy Scouts Troop #45 Family Night. (Frye - 78)
	10	- Saginaw Woman's Club. (Frye - 35)
	12	- Burt Cub Scouts Annual Banquet. (Frye - 235)
	16	- University of Michigan Wildlife Students Seminar. (Frye - 40)
	18	- Michigan State University Wildlife Students Seminar. (Frye - 30)
March	18	- Webber Jr. High Social Studies Classes. (Frye - 2 talks - 62)
	24	- Arthur Hill High School Biology Club. (Frye - 120)
	31	- Laport Methodist Church, Father-Son Banquet. (Frye - 140)
April	13	- Birch Run Boy Scouts Troop. (Bober - 24)
May	11	- Flint Boy Scouts Troop. (Bober - 38)
	14	- American Association of Retarded People - Saginaw. (Frye - 44)
	21	- Buna Vista High School Economics Class. (Poma - 40)
	26	- All Saints High School Conservation Classes Bay City. (Frye & Bober - 112)
	27	- St. Thomas School 3rd Grades. (Poma - 68)
July	28	- Central Michigan University Teachers Workshop. (Frye - 30)
September	15	- Ducks Unlimited Banquet, Midland. (Frye - 180)
October	12	- Michigan State University Waterfowl Class. (Frye - 36)
	20	- Birch Run Lions Club. (Frye - 36)
November	12	- Saginaw Valley Community Woman's Club. (Frye - 86)

December 3 - Freeland High School Biology Class. (Bober - 18)

7 - Holy Cross Lutheran Church Men's Club, Saginaw. (Frye - 38)

16 - Civitan Club, Saginaw. (Bober - 16)

19 - Rochester Boy Scout Troop. (Frye & Bober - 17)

4. Student Interviews.

John R. Frye and John Willbrecht, Refuge Manager at Seney Refuge, conducted student interviews with college Juniors and Seniors. They were at the University of Michigan February 17 and at Michigan State University on February 18.

5. Radio and Television.

March 30 - WNEM-TV 6:00 P.M. News. Five minute color movie of waterfowl concentrations on Shiawassee Refuge and taped interview with Frye. Repeated on the 11 P.M. News.

April 7 - WNEM-TV 6:00 P.M. News. Five minute color movie on color marking of Whistling Swans and taped interview with Frye. Repeated on the Noon News spot April 8).

April 8 - WNEM-TV 6:00 P.M. News. Five minute movie on net trapping, swan marking and taped interview with Frye.

April 13 - WNEM-TV 6:00 P.M. News. Five minute color movie of swans and announcement of open house at Shiawassee Refuge.

April 30 - WNEM-TV. "Michigan Outdoors" ten minute color movie on spring migrants, goose banding, etc. at Shiawassee Refuge.

D. Hunting.

1. Managed Goose Hunting.

Shiawassee Refuge had managed goose hunting in the outlying areas of the refuge in 1970. Special regulations were established for the Saginaw Goose Management Area again this year by the state of Michigan. The management area contains the Shiawassee River State Game Area, 50,000+ acres of private land, and the refuge. This year there was half day hunting for geese (before noon) and the

normal bag limit of 2 Canada geese with a total of 5 geese. The refuge had goose hunting only during the waterfowl season. Both ducks and geese were fair game in the rest of the management area.

Applications were made available to interested hunters the second week of August. The applications were sorted and filed as they were received at the office. The applications were accepted as long as they were postmarked on or before September 15. Eight hundred twenty four valid reservations were made from the applications, out of a possible 1,150 reservations available. This compares to 572 applications received last year.

The drawing was held on September 18, the 824 successful applications were validated and mailed out to 157 different cities and towns in Michigan.

This is the second year the Bureau has had an agreement with the Michigan Department of Natural Resources covering their operation of the managed goose hunting on Bureau lands located west of the Flint River and South of the Shiawassee River. The reasons for the agreement are: the MDNR field office is closer to the areas, access to the areas is across state land and from the refuge hunter check station it is necessary to go through the city of Saginaw to reach the area. The state administered the area under the Bureau hunting regulation except the blinds were not reserved and no fee was required. The state had a daily drawing for all blinds in the area under it's control.

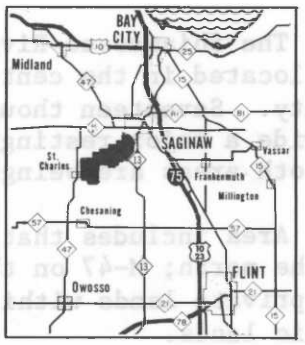
This year 15 new pit blinds were constructed. Along with the 25 wood upright blinds from last year a total of 40 blinds were available for the hunters. The entire 40 blinds were hunted the first week and only 25 thereafter, so that the areas not harvesting geese could be rested.

General procedures for the daily operation of the hunt were unchanged from the preceeding year. Hunters with valid reservations were checked in up to one hour prior to legal shooting time. When the hunter arrived at the check-in station he presented a valid permit, paid his fee, drew for the blind, received directions to the blind and set forth for the hunt. Hunters without reservations were assigned to unreserved blinds and no-show reserved blinds by luck of the draw on a first come first serve basis at 59 minutes before legal shooting time.

There were only three days this year that all blinds were not filled. On most days standby hunters were turned away. The standby hunters were lining up some mornings at midnight or earlier to be first in line. Due to the strike against General Motors there was an unusually high interest in goose hunting this year. There are several GM plants in the area.

MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

SAGINAW COUNTY GOOSE MANAGEMENT AREA



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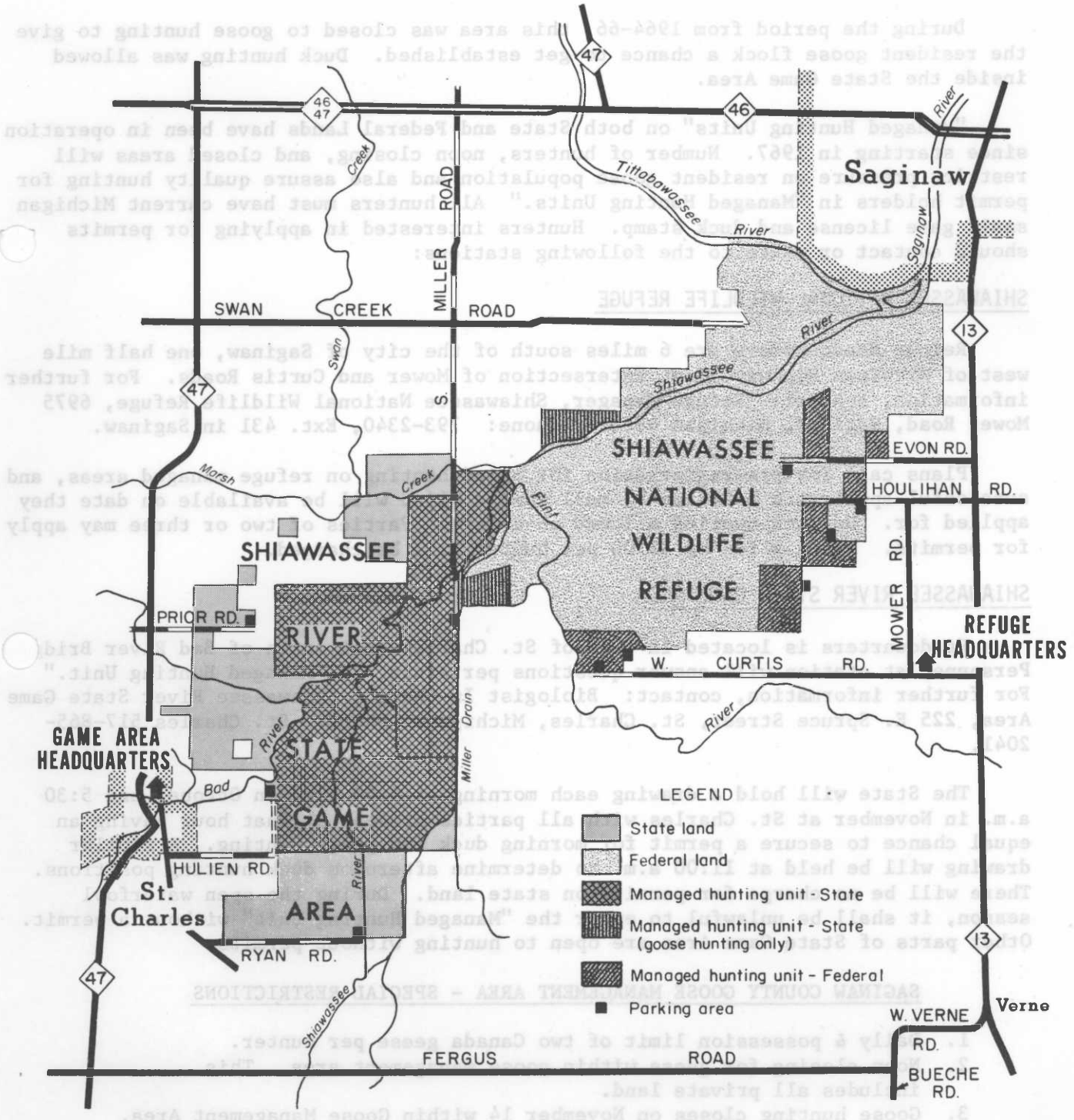


MAP - 2148
1970

SAGINAW COUNTY GOOSE MANAGEMENT AREA

The Shiawassee River State Game Area and Shiawassee National Wildlife Refuge are located in the center of this "Managed Waterfowl Area" in north-central Saginaw County. Seventeen thousand acres of public land dedicated to waterfowl management provide a major resting and feeding area for ducks and geese. Agricultural crops in both areas are being produced on a co-operative basis with local landowners.

Area includes that part of Saginaw County enclosed by M-13 on the east; M-46 on the north; M-47 on the west; and Fergus, Bueche, and Verne Roads on the south. All private lands within these boundaries have the same hunting restrictions as public lands.

During the period from 1964-66, this area was closed to goose hunting to give the resident goose flock a chance to get established. Duck hunting was allowed inside the State Game Area.

"Managed Hunting Units" on both State and Federal Lands have been in operation since starting in 1967. Number of hunters, noon closing, and closed areas will restrict pressure on resident goose population and also assure quality hunting for permit holders in "Managed Hunting Units." All hunters must have current Michigan small game license and duck stamp. Hunters interested in applying for permits should contact or write to the following stations:

SHIAWASSEE NATIONAL WILDLIFE REFUGE

Refuge Headquarters are 6 miles south of the city of Saginaw, one half mile west of Michigan Highway 13 at Intersection of Mower and Curtis Roads. For further information, contact: Refuge Manager, Shiawassee National Wildlife Refuge, 6975 Mower Road, Saginaw, Michigan 48601. Phone: 793-2340, Ext. 431 in Saginaw.

Plans call for pre-registration for blind hunting on refuge managed areas, and successful applicants notified by mail that a blind will be available on date they applied for. No duck hunting allowed on refuge. Parties of two or three may apply for permits. A daily fee of $2.00 per hunter will be charged.

SHIAWASSEE RIVER STATE GAME AREA

Headquarters is located in town of St. Charles just north of Bad River Brid Personnel at station will answer questions pertaining to "Managed Hunting Unit." For further information, contact: Biologist In Charge, Shiawassee River State Game Area, 225 E. Spruce Street, St. Charles, Michigan. Phone: St. Charles 517-865-2041.

The State will hold a drawing each morning at 5:00 a.m. in October and 5:30 a.m. in November at St. Charles with all parties present at that hour having an equal chance to secure a permit for morning duck and goose hunting. A similar drawing will be held at 11:00 a.m. to determine afternoon duck hunting positions. There will be no charge for permits on state land. During the open waterfowl season, it shall be unlawful to enter the "Managed Hunting Unit" without a permit. Other parts of State Game Area are open to hunting without permits.

SAGINAW COUNTY GOOSE MANAGEMENT AREA - SPECIAL RESTRICTIONS

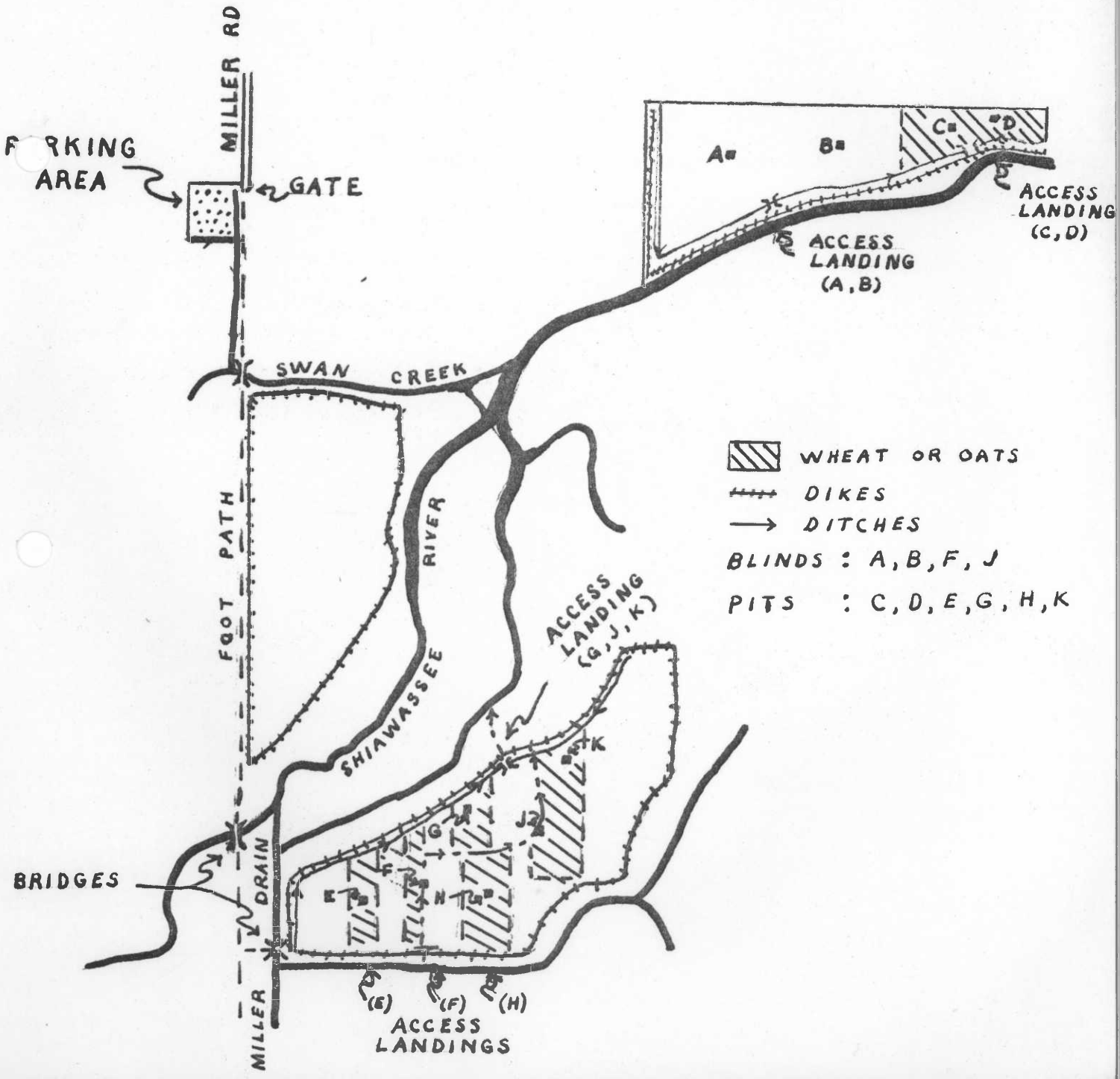
1. Daily & possession limit of two Canada geese per hunter.
2. Noon closing for geese within goose management area. This includes all private land.
3. Goose hunting closes on November 14 within Goose Management Area.

SHIAWASSEE NATIONAL WILDLIFE REFUGE

Hunting Areas under State Administration

-REGULATIONS-

1. NO DUCK HUNTING. GOOSE HUNTING IN A.M. ONLY.
2. DAILY & POSSESSION LIMIT OF ONE CANADA GOOSE PER HUNTER.
3. ONLY PARTIES OF TWO ARE ELIGIBLE FOR PERMITS.
4. DAILY FEE OF $ 2.00 PER HUNTER.
5. SHOTGUN SIZE LIMITED TO 16 GA. OR LARGER.



A total of 2,696 people hunted during the goose season which ran from October 1 through November 14. One thousand four hundred and fifty four or 53.9% of the hunters had reservations while 1,242 were standby hunters.

There were six pits and four blinds operated by the state on Bureau lands. Five hundred twenty two people hunted these blinds and harvested a total of 134 geese. Last year only 192 hunters used these areas when the state charged a fee for the Bureau. The state does not charge for hunting state lands. There was over a 100% increase in the number of hunters on the Bureau land the state manages this year compared to last year, with the major change being no fee charged.

A total of 866 geese were t aken by 3,218 hunters at Shiawassee Refuge this fall. Seven hundred thirty two geese were harvested from the blinds assigned at refuge headquarters and 134 from the blinds ran by the state on Bureau lands. A total of 16,227 man hours were expended by hunters in the managed goose hunt this year.

There were 26 geese taken that were identified as locals. These included 2 hatched in 1965, 2 in 1966, 2 in 1967, 3 in 1968, 1 in 1969 and 16 in 1970.

The age and sex of the geese harvested at the refuge are as follows:

HY	M	245	TOTAL	M	373
HY	F	223		F	354
AHY	M	128		HY	468
AHY	F	131		AHY	259

to give a ratio of 1 female : 1.05 male and 1 adult : 1.81 immature. The overall hunter success ratio was 27%, which compares to 13% last year. The hunters were very happy with the program and many returned to hunt as standbys several times during the season.

2. Deer Hunting.

The Michigan firearms deer season was from November 15 through November 30. Shotguns or muzzle loaders are the only legal firearms in this section of the state. Slightly over half the refuge was open to deer hunting with gun. An estimated 3,697 hunters hunted the 4,800 acres open on the refuge. A legal kill of 40 and an illegal kill of 25 deer was made. The illegal kill over the last three years has been 50% the legal kill.

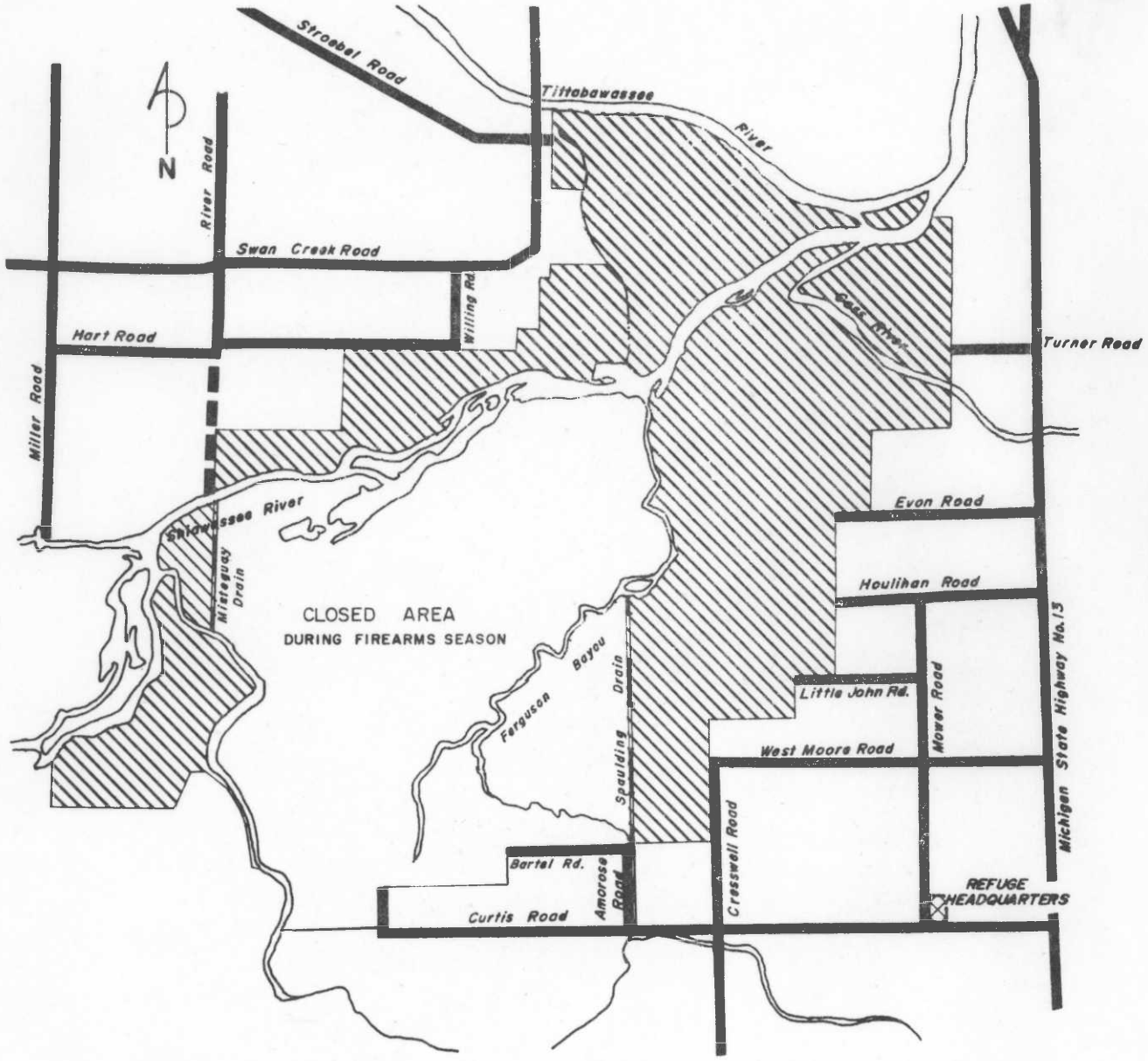
The entire refuge was open to bow and arrow hunting during the month of December. The month was divided into three periods, two of which were permit periods. December 1 - 7 and 8 - 15 hunters were required to have permits, 16 - 31 the entire refuge was open to all bow hunters. There were 500 permits available for each of the two permit periods.

Notice was released to all newspapers in the southern part of the state during the last week of August, and a follow-up notice sent out the second week of October. The notices explained the procedures to follow in applying for a permit. The hunter was to mail a self-addressed post card to the refuge with the permit period and his bow license number in the upper right hand corner of the message side of the card. The envelope containing the cards had to be postmarked by October 31, or earlier, to be eligible for the drawing. One thousand one hundred cards were correctly submitted for the period December 1 - 7. The drawing was held and 500 cards drawn and all cards were returned to the sender. The second period 8 - 15 was under applied for and all applicants were issued permits. There were probably over 4,000 total applications submitted with 60% being too late or incorrectly filled out. Several of the newspapers held our news releases until November and then printed the information leaving all reference to the cut-off date for applying out of their articles.

By issuing permits the number of hunters was effectively controlled but the quality of hunters leaves much to be desired. This year the feeling was that by requiring the bow license number to be on the permit application we might get only <u>true</u> bow hunters applying. As in the past, there still seems to be more hunters with bows than bow hunters. Maybe the "great american sportsman" is dead and gone, or was he only a myth?

People using bows managed to spear 40 deer during the month of December. The entire refuge staff feels that bow hunting is a poor way of killing any animal and if this season was done away with nobody here would miss it. Deer hunters as a class seem to be more rude and demanding than any other type of hunter. The deer hunter will believe any story that might explain his failure to bag a deer as long as it lays the blame on someone else. The refuge staff has been accused of shipping deer off the refuge after dark in trucks, of sawing the antlers off bucks so they would become anterless deer and of hiding the deer in some secret place so the hunters couldn't find them.

All in all the staff was happy to see the new year start, after three months of hunting on the refuge it is nice to do other work besides watching the hunters. The best part of the new year is the end of the work day, you get to go home.



SHIAWASSEE NATIONAL WILDLIFE REFUGE

DEER HUNTING REGULATIONS

REFUGE BOUNDARY

1 INCH = 1 MILE

OPEN DURING FIREARMS DEER SEASON

GENERAL REGULATIONS

Public hunting for deer only, in accordance with State Deer Hunting Regulations, authorized only on areas designated Public Hunting Area, by signs, during the firearms season, November 15 - 30.

All refuge lands open to bow and arrow hunting for deer during the late season, December 1 - 31, only. Special permit required for bow and arrow hunting during the period December 1 - 15. No permit required from December 16 - 31.

All hunters must exhibit their hunting license, deer tag, game, and vehicle contents to Federal and State Officers upon request.

E. Violations.

Snowmobiles in the winter and motorcyclists in the summer are a continuing problem with no solution in sight. When you are able to catch someone in the act of trespassing the next problem is getting prosecution in Federal Court. So far prosecution has been one of the biggest problems.

Someone, party or parties unknown, broke into the headquarters building on August 30, 1970. We lucked out in that the only thing taken was the spare tire and wheel from the station wagon. The thief(s) passed up such things as typewriters, cameras, adding machines, etc.

The following cases were tried in State Court. At the present time 17 cases from this year and 8 cases from 1969 are still pending in Federal Court.

Name	Violation	Court Action
Teboe, R. H.	Hunting on refuge	$10.00 Fine - $21.00 Costs
Schmidt, R. A.	Hunting on refuge	$10.00 Fine - $20.00 Costs
Murawski, G. W.	Hunting on refuge	$10.00 Fine - $20.00 Costs
Pulaski, B. G.	Trespass with snowmobile	$ 9.00 Fine - $ 6.00 Costs

F. Safety.

Monthly safety meetings were held during the year with members of the staff presenting the programs as follows:

January 5 - Review 1969 safety program, winter driving. (Frye)

February 2 - Electrical power tools, use of vehicle safety belts. (Poma)

February 27 - Safe driving under adverse conditions, film. (Robinson)

March 30 - Safe boating. (Shelley)

May 1 - Safety after the Safety Meeting. (Blazo)

June 5 - Safety and power mowers. (Robinson)

July 7 - Axe and saw safety. (Gillmore)

August 3 - Treatment for shock, heat stroke and heat exhaustion. (Rolf)

The station safety record had reached 349 days when heavy equipment operator Larry Blazo injured himself on May 11. Larry was removing a sapling from under the blade of the D-8 dozer when a blood vessel in his bicep broke. His arm turned a bright greenish purple color and the doctor told him to stay in bed for three or four days. As of the end of the year the new safety record was 209 days.

VII. OTHER ITEMS

A. Personnel.

Gaylord J. Bober entered on duty as Refuge Manager, Trainee, on February 24, 1970. Gaylord is a graduate of Michigan State University with a degree in Wildlife Management, and came to Shiawassee following completion of his military obligation. He was a 1st Lieutenent in the U. S. Army and for two years served as Fish and Wildlife Manager at Fort Carson, Colorado.

Louis D. Robinson, Biological Technician, was promoted from GS-6 to GS-7, with increased law enforcement responsibilities, effective February 8, 1970. Louie was not satisfied with his new position and eventually resigned from Government Service, effective December 18, 1970. In his 16 years service with the Bureau, all at Shiawassee Refuge, Robinson progressed from a temporary position as heavy equipment operator, to heavy duty mechanic, to Biological Technician. Much of the progress of the refuge programs during these years was a direct result of Louie's enthusiasm, initiative, and interest in seeing the job well done. He has accepted a newly established position as Chief of Police for Bridgeport Township.

Sam Poma, Refuge Clerk, completed 20 years of Government Service on October 17, 1970, and was presented his 20 year pin. Sam has served as the first and only refuge clerk at Shiawassee, and is the last of the original staff.

Lott Rolf, a graduate of Arkansas F & M College, worked at Shiawassee this summer under an appointment as Soil Conservation Aid, GS-5, until he was drafted in September.

During the summer four minority high school students, from the Neighborhood Job Corps worked on the refuge. They proved to be very benificial to the program, with the only drawback being that they required constant supervision.

B. Photographs.

All photos were taken with refuge equipment and processed in the office bathroom.

C. Credits.

The entire report was prepared by Gaylord J. Bober, Refuge Manager, Trainee, as part of his training. Typing and assembly was by Refuge Clerk Sam Poma.

SIGNATURE PAGE

Submitted by:

Gaylord J. Bober
(Signature)

Gaylord J. Bober

Refuge Manager, Trainee
Title

Date: February 5, 1971

Approved, Regional Office:

Date: FEB 22 1971

James B. Monnie
(Signature)

ASST
Regional Refuge Supervisor

Approved by:

John R. Frye
Refuge Manager

John R. Frye
Refuge Manager

Gaylord J. Bober
Ass't Refuge Manager

S. Sam Poma
Refuge Clerk

Lawrence J. Blazo
Eng. Equip, Oper.

Kenneth H. Shelley
Med. Equip. Oper.

70-2 & 3; 01-22-70; JRF

Removal of merchantable timber from Pool 3. Portable mill cut pallet materials and larger logs stacked to be hauled away.

70-4; 03-24-70; JRF

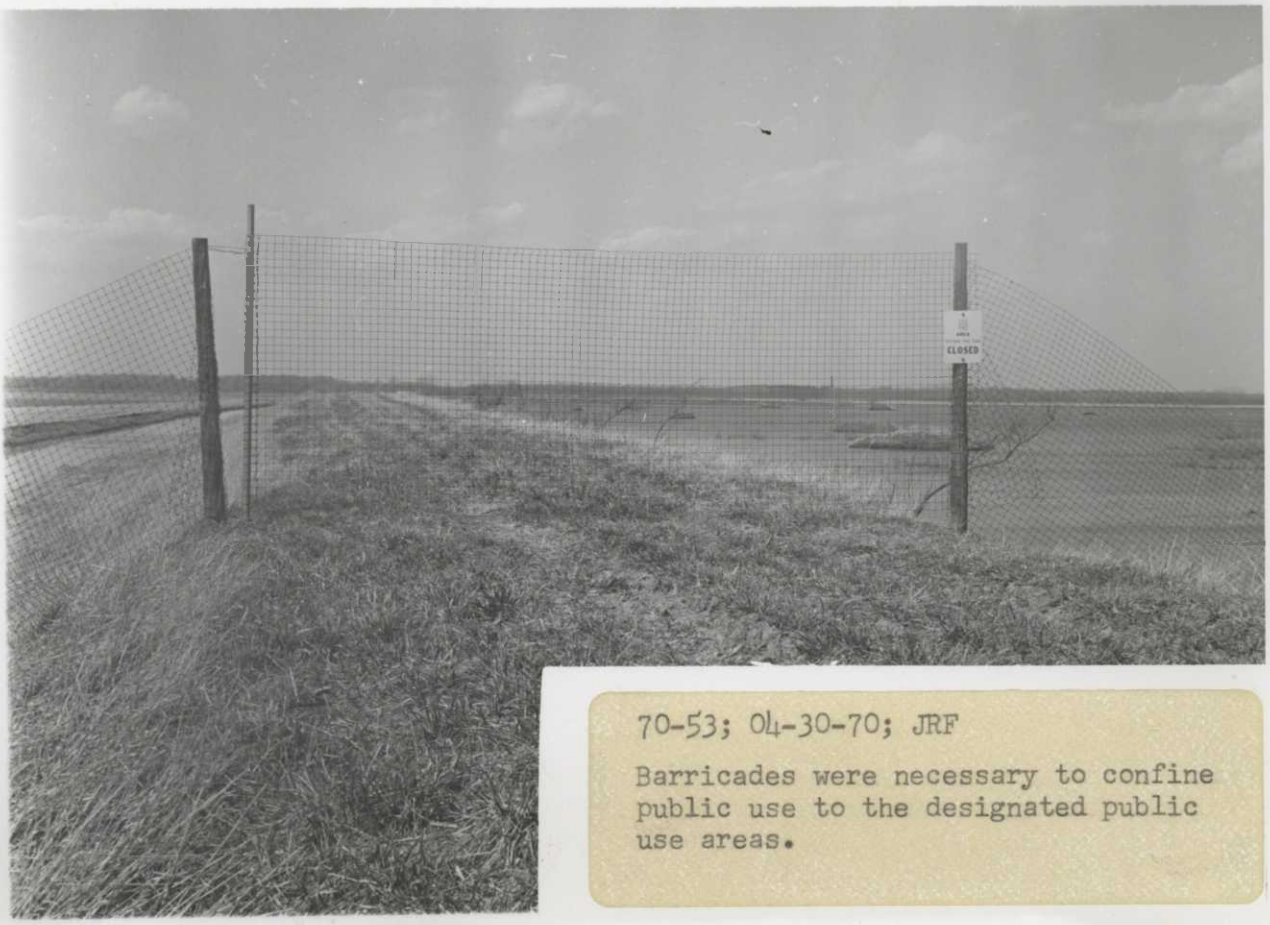
Refuge boundary markers were modified to clear up confusion in the minds of the public.

70-7; 04-03-70; JRF

Modified paper towel dispenser to supply trail maps.

70-6; 04-03-70; JRF

New trail signs were installed to direct flow of foot traffic.

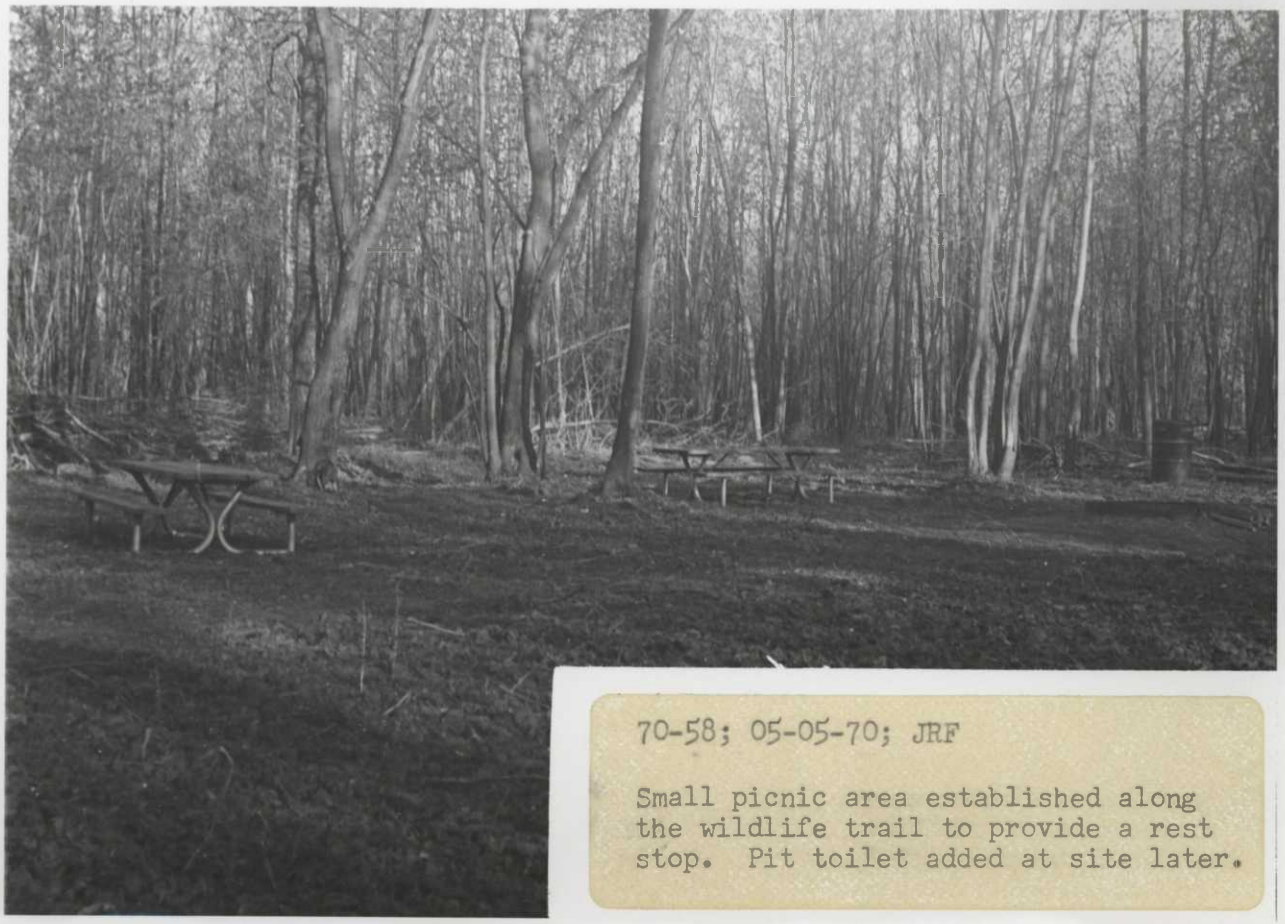


70-53; 04-30-70; JRF

Barricades were necessary to confine public use to the designated public use areas.

70-32; 04-15-70; JRF

"Little Theatre" was set up in the refuge shop for open house activities.

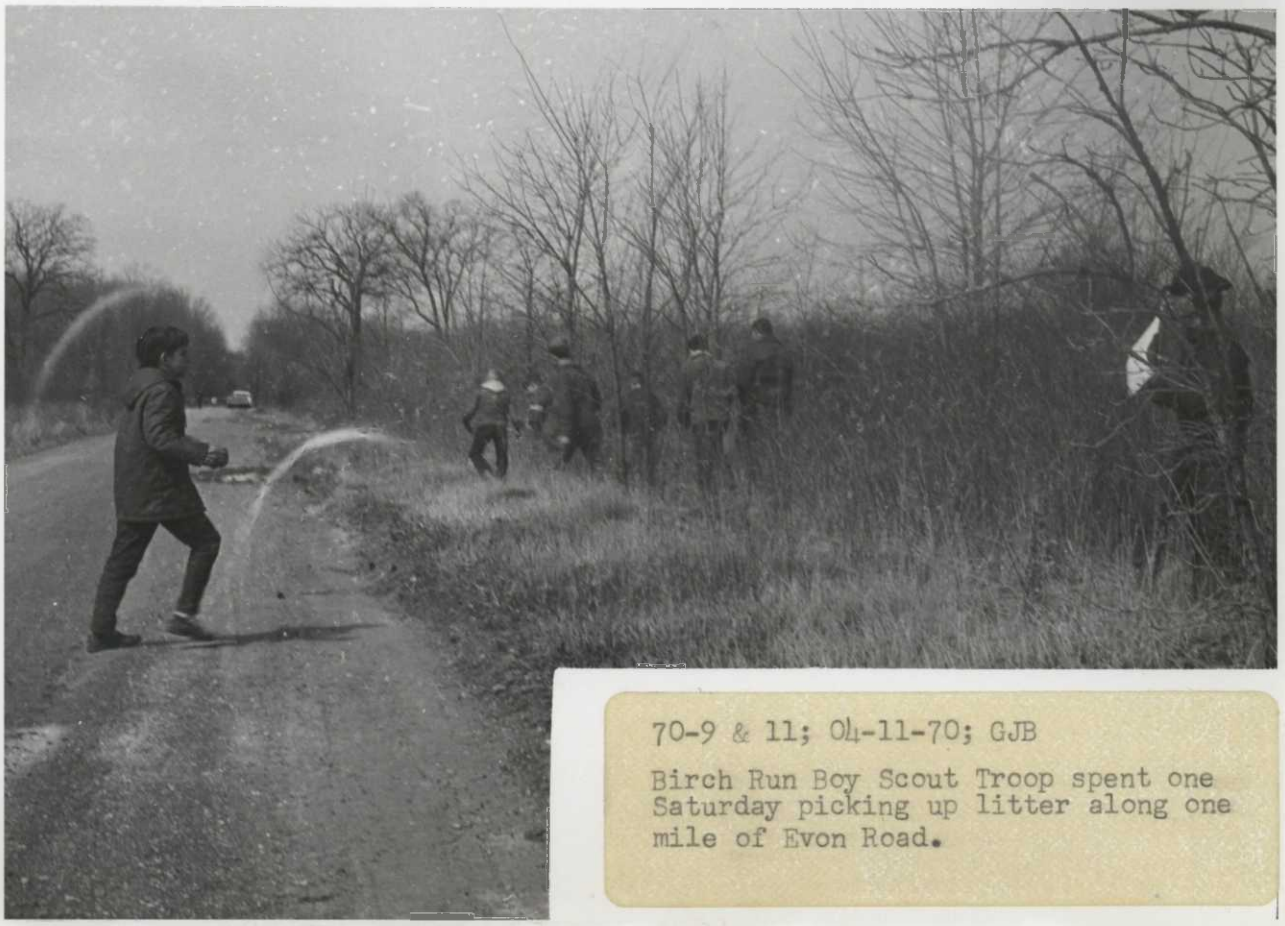


70-58; 05-05-70; JRF

Small picnic area established along the wildlife trail to provide a rest stop. Pit toilet added at site later.

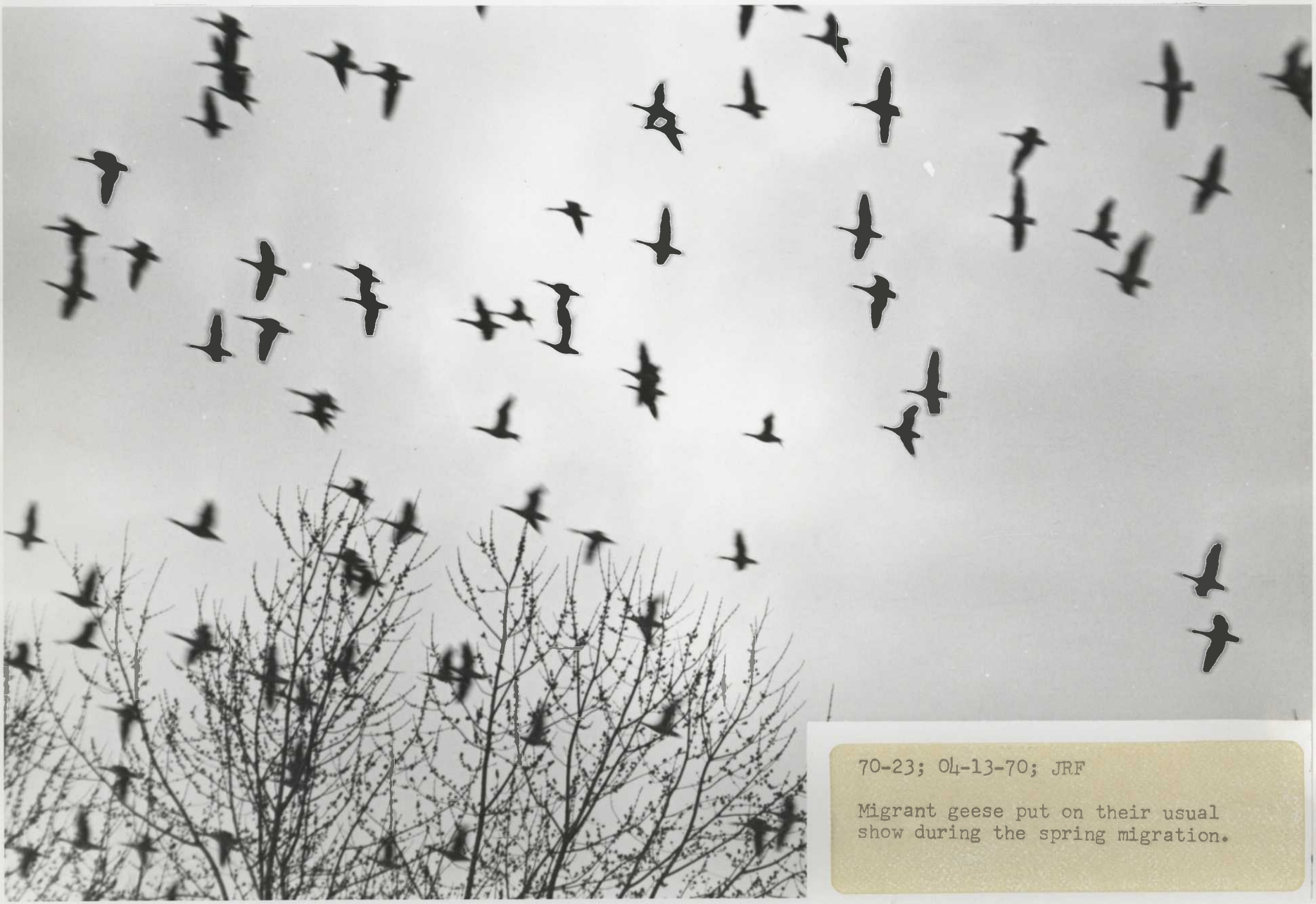
70-34 & 35; 04-23-70; JRF

One of many elementary school groups that visited the refuge. A short pep talk was followed by a walk to observe Conservation in Action.



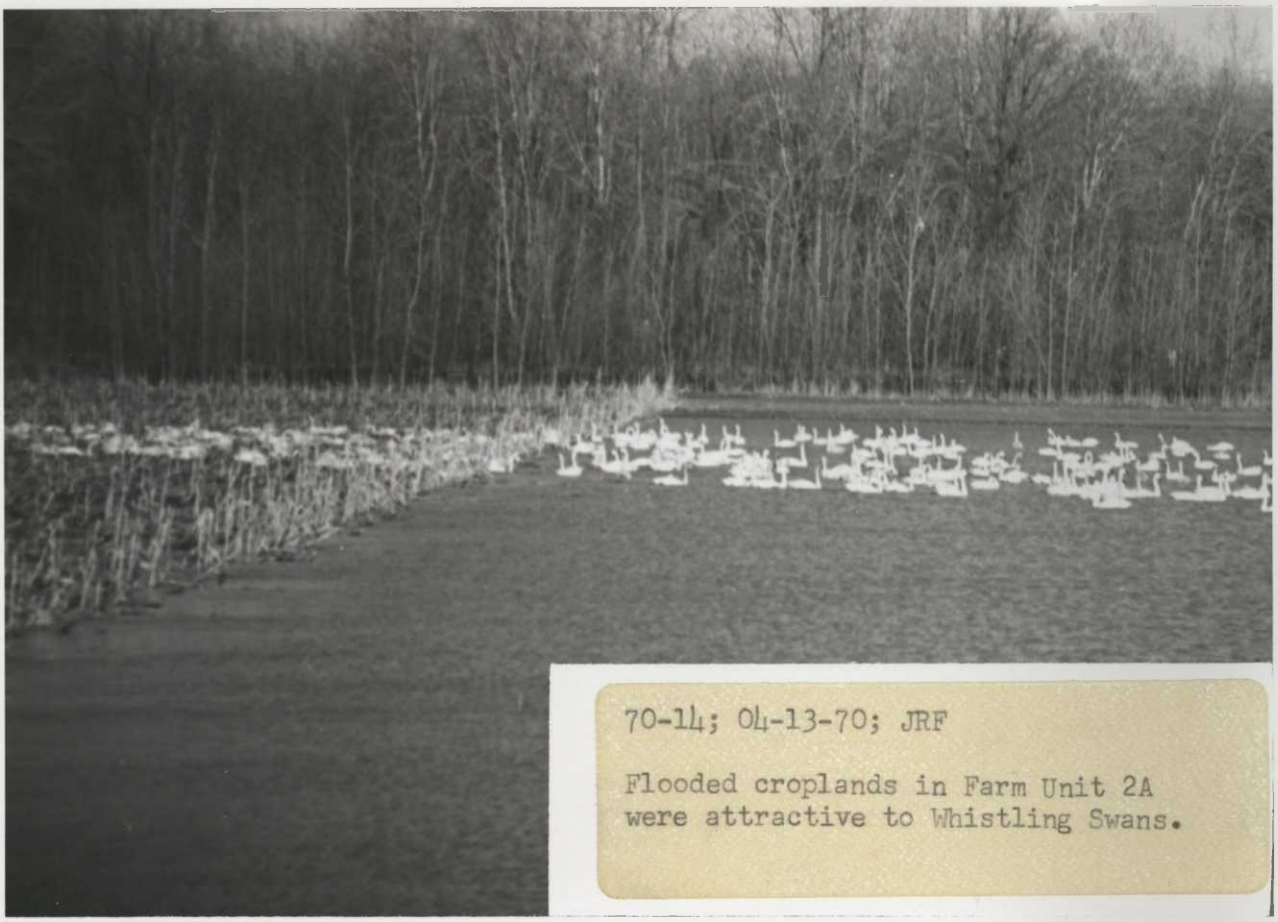
70-9 & 11; 04-11-70; GJB

Birch Run Boy Scout Troop spent one Saturday picking up litter along one mile of Evon Road.



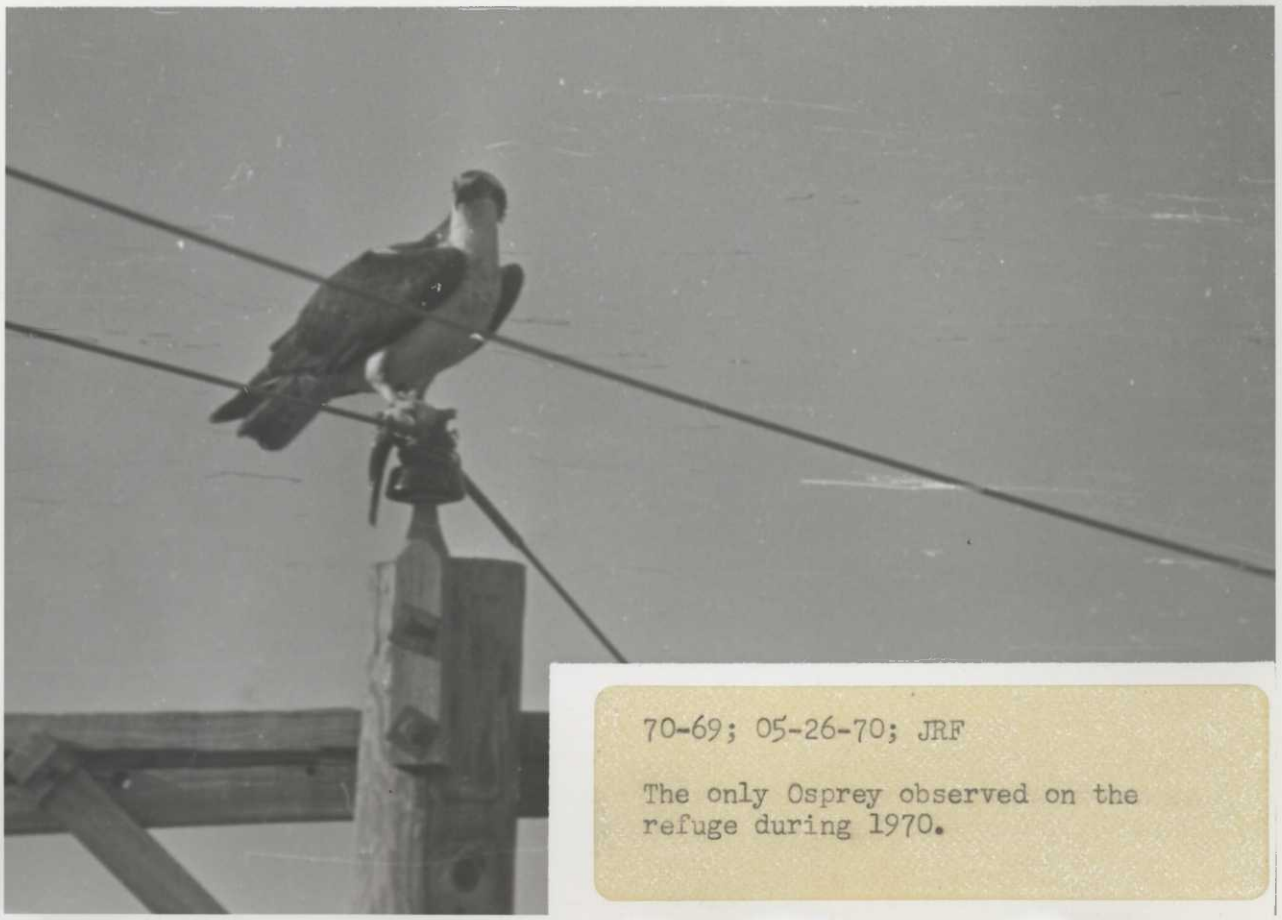
70-23; 04-13-70; JRF

Migrant geese put on their usual show during the spring migration.



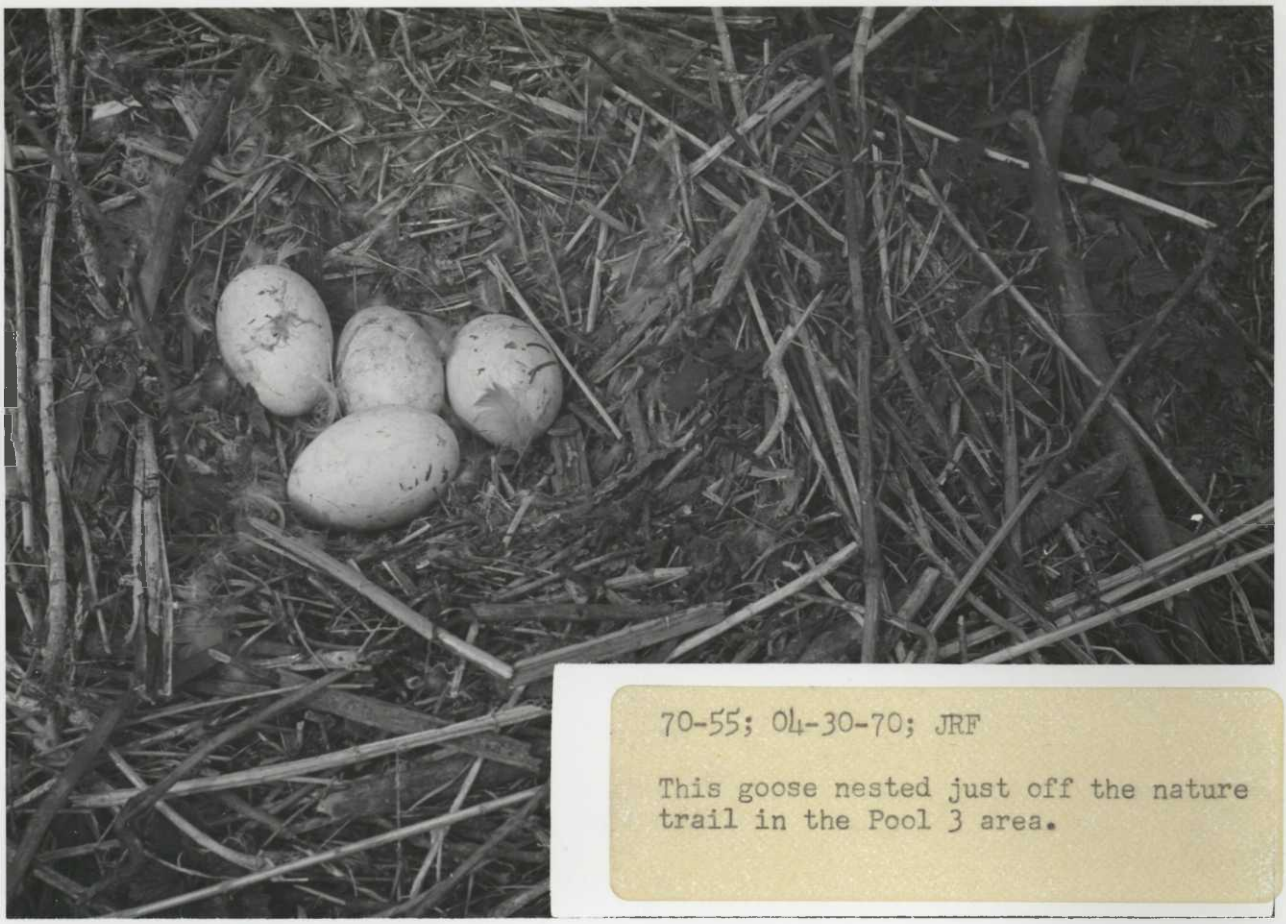
70-14; 04-13-70; JRF

Flooded croplands in Farm Unit 2A were attractive to Whistling Swans.



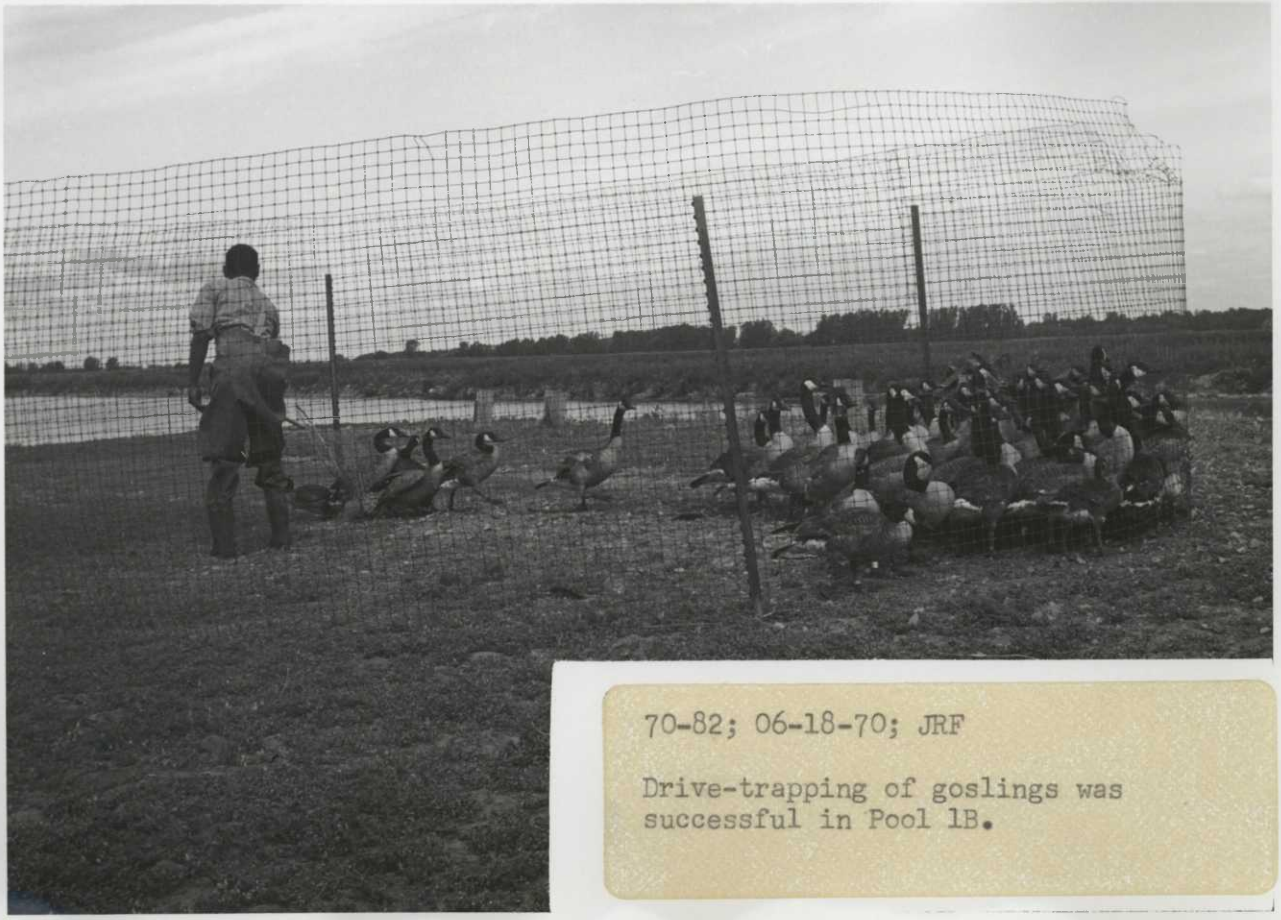
70-69; 05-26-70; JRF

The only Osprey observed on the refuge during 1970.



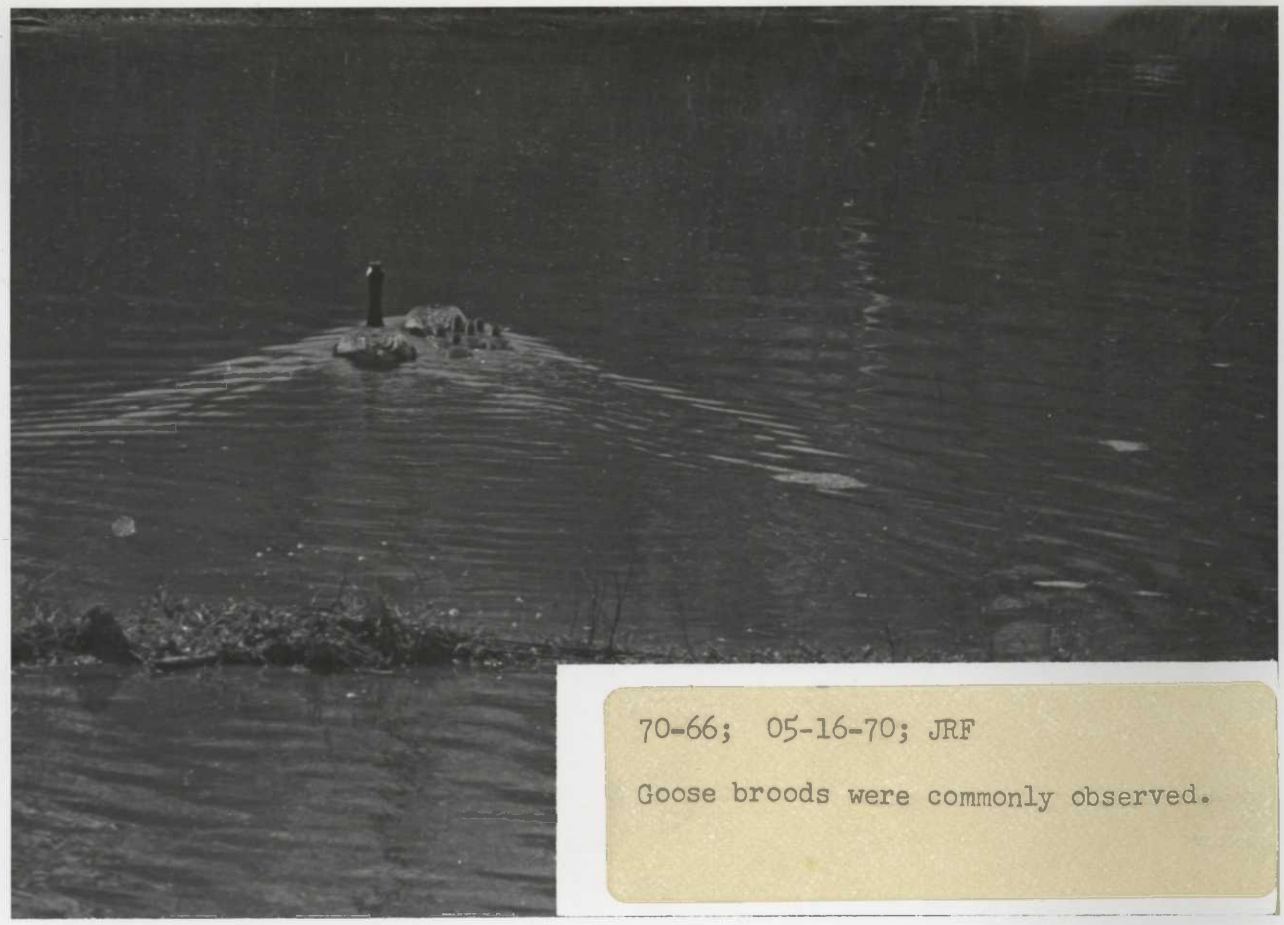
70-55; 04-30-70; JRF

This goose nested just off the nature trail in the Pool 3 area.



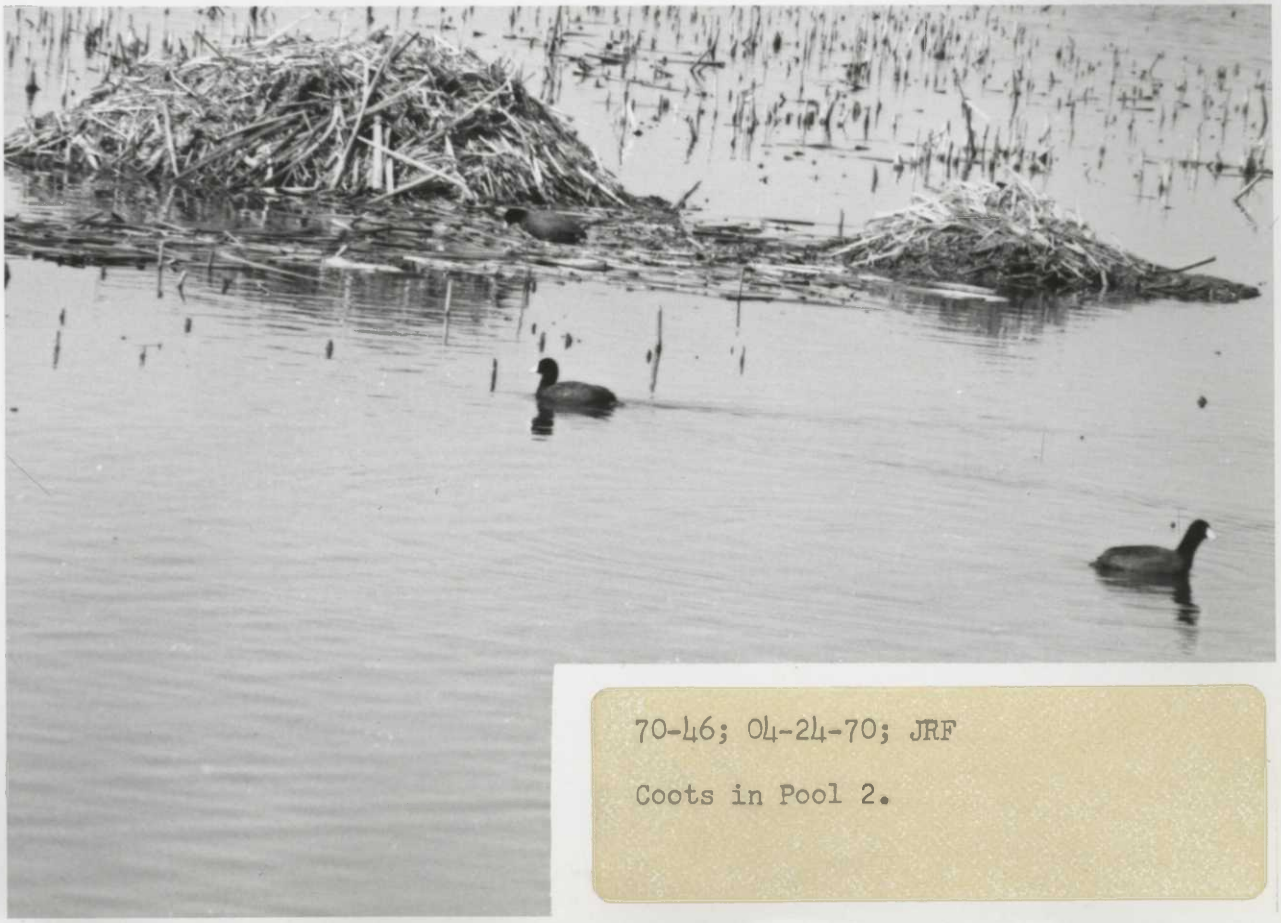
70-82; 06-18-70; JRF

Drive-trapping of goslings was successful in Pool 1B.



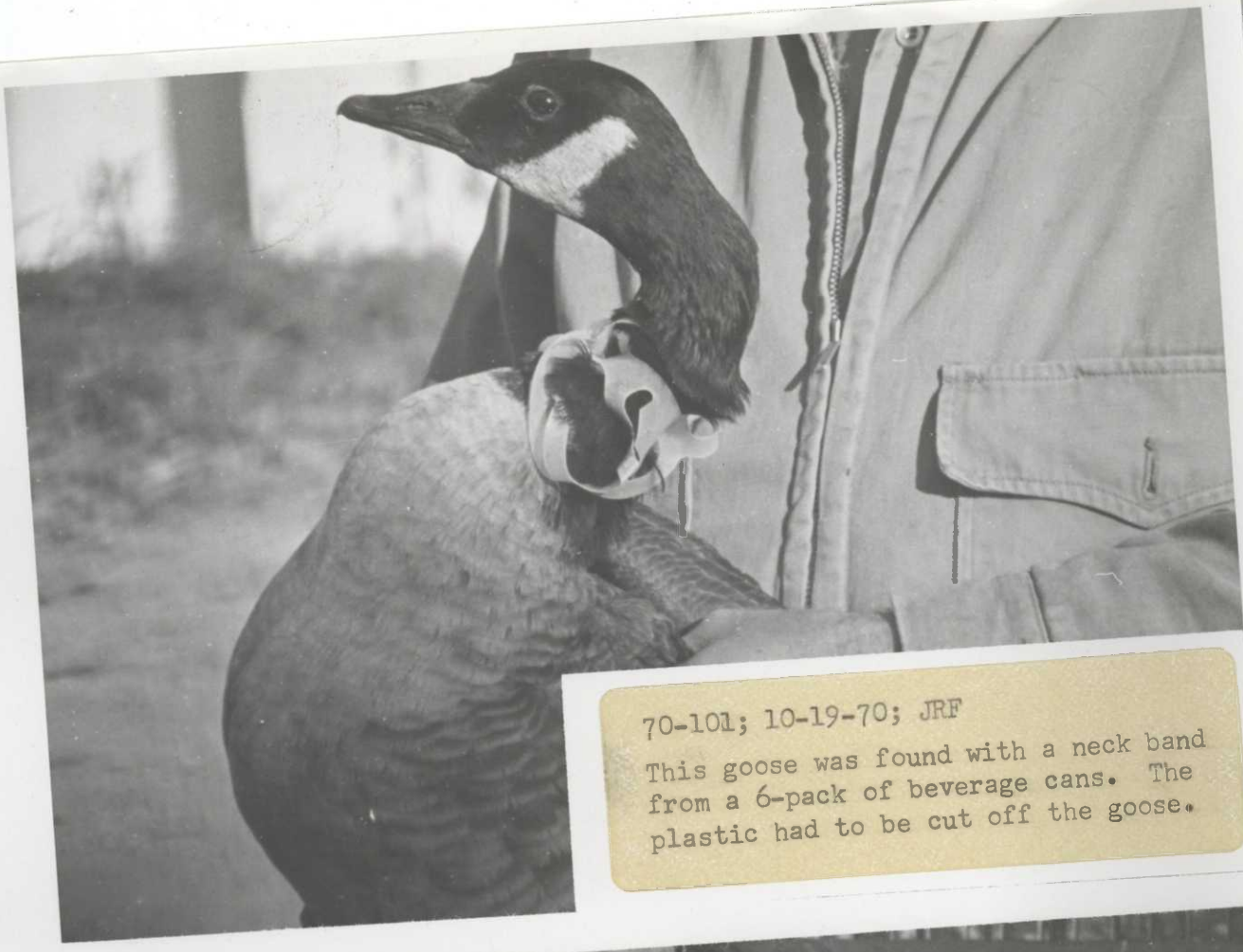
70-66; 05-16-70; JRF

Goose broods were commonly observed.



70-46; 04-24-70; JRF

Coots in Pool 2.

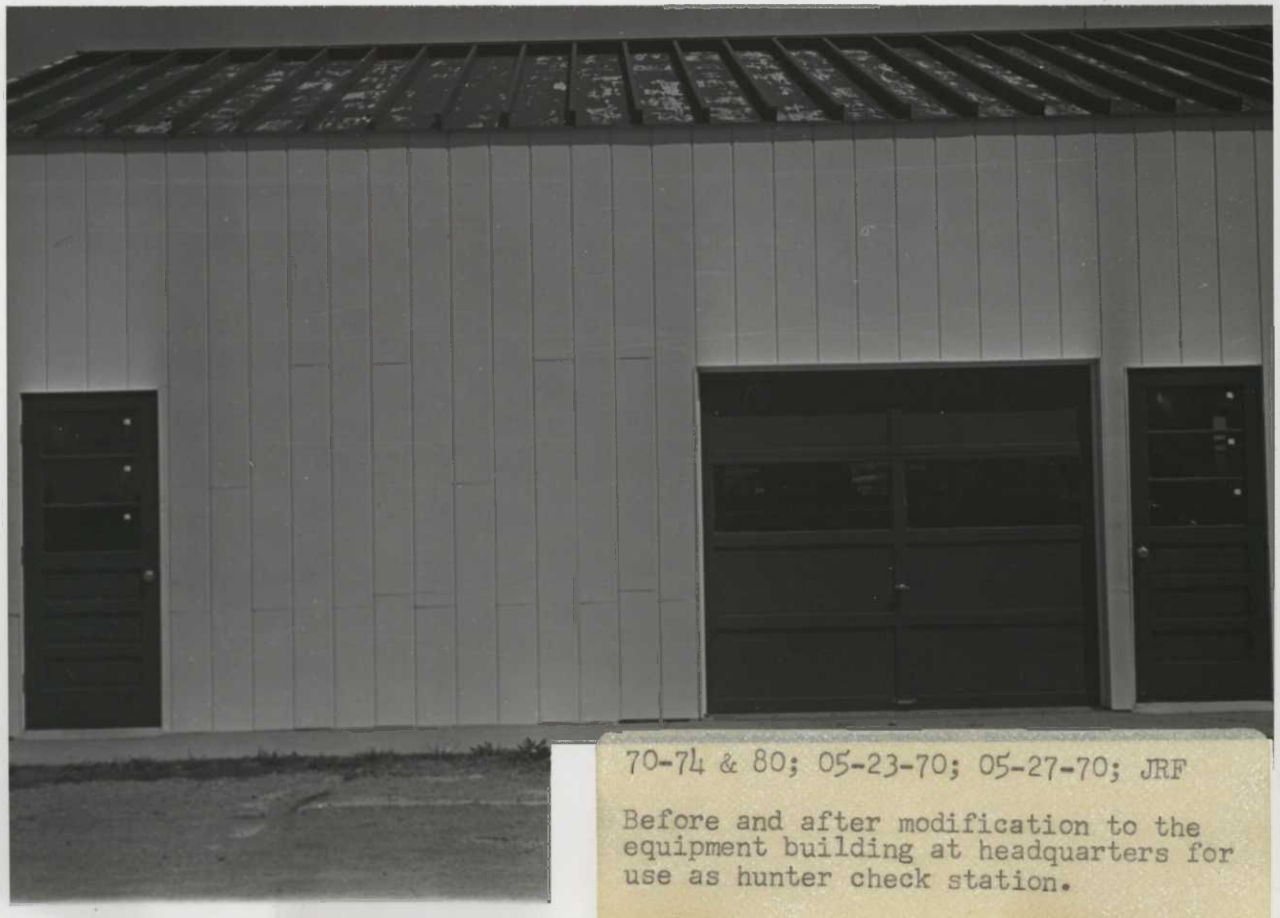


70-101; 10-19-70; JRF

This goose was found with a neck band from a 6-pack of beverage cans. The plastic had to be cut off the goose.

70-103; 10-19-70; JRF

Miss Hilde Bechtold, Student-Intern working out of R.O., was given the opportunity to assist in goose banding.

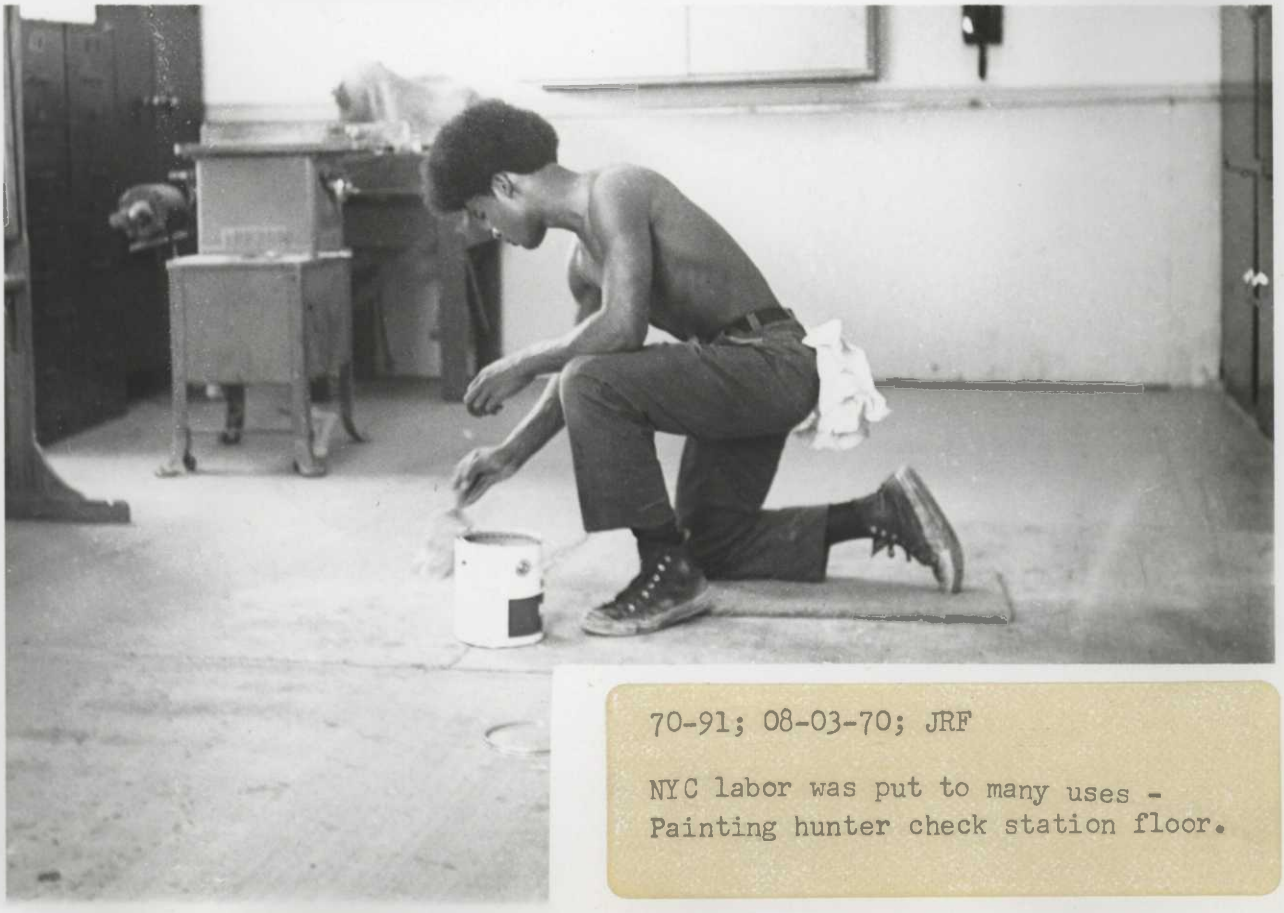


70-74 & 80; 05-23-70; 05-27-70; JRF

Before and after modification to the equipment building at headquarters for use as hunter check station.

70-87; 07-20-70; JRF

Refuge manpower and equipment was used for some of the flood damage repair work.

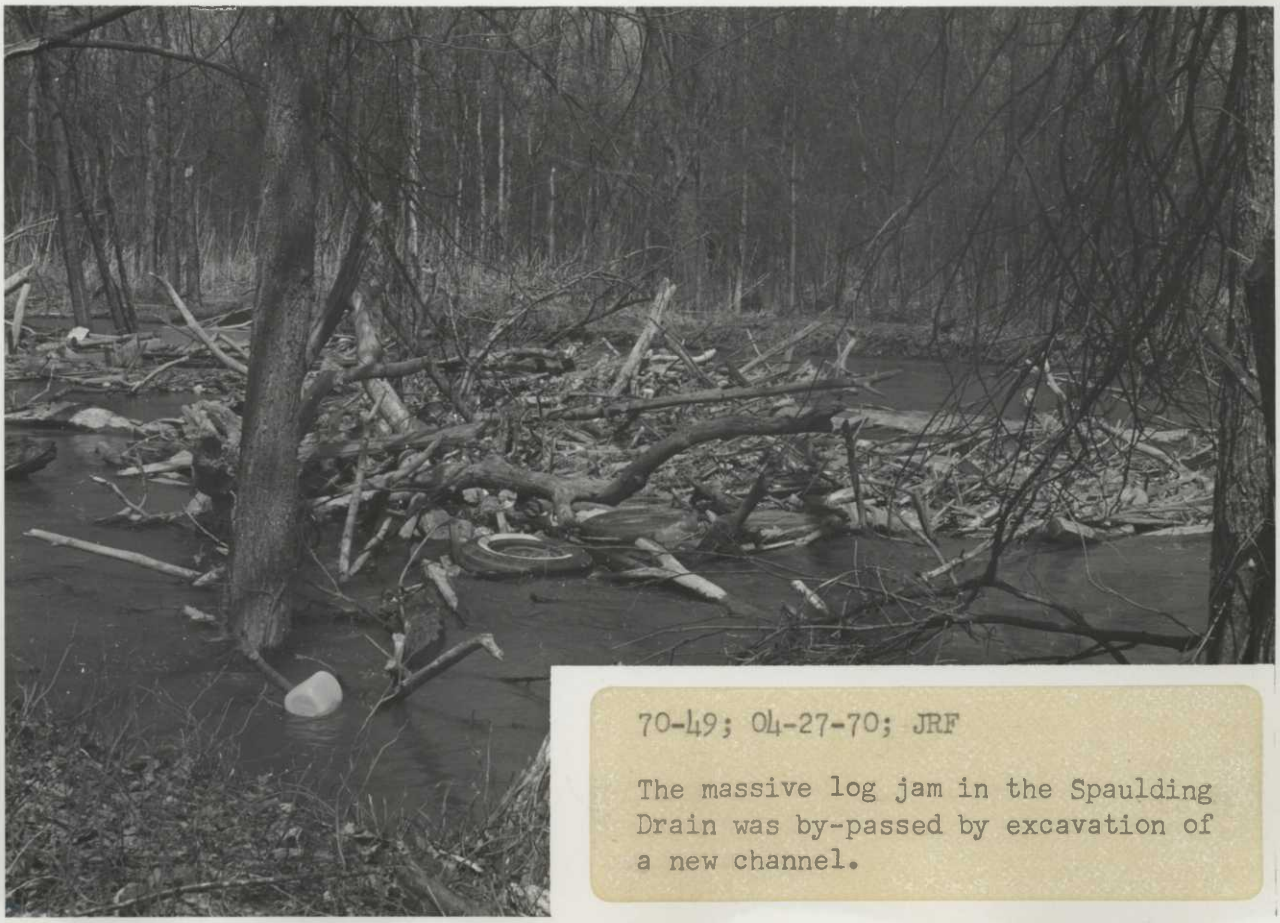


70-91; 08-03-70; JRF

NYC labor was put to many uses - Painting hunter check station floor.

70-56; 04-30-70; JRF

Pool 3, when inundated by flood waters, furnishes excellent wood duck habitat.

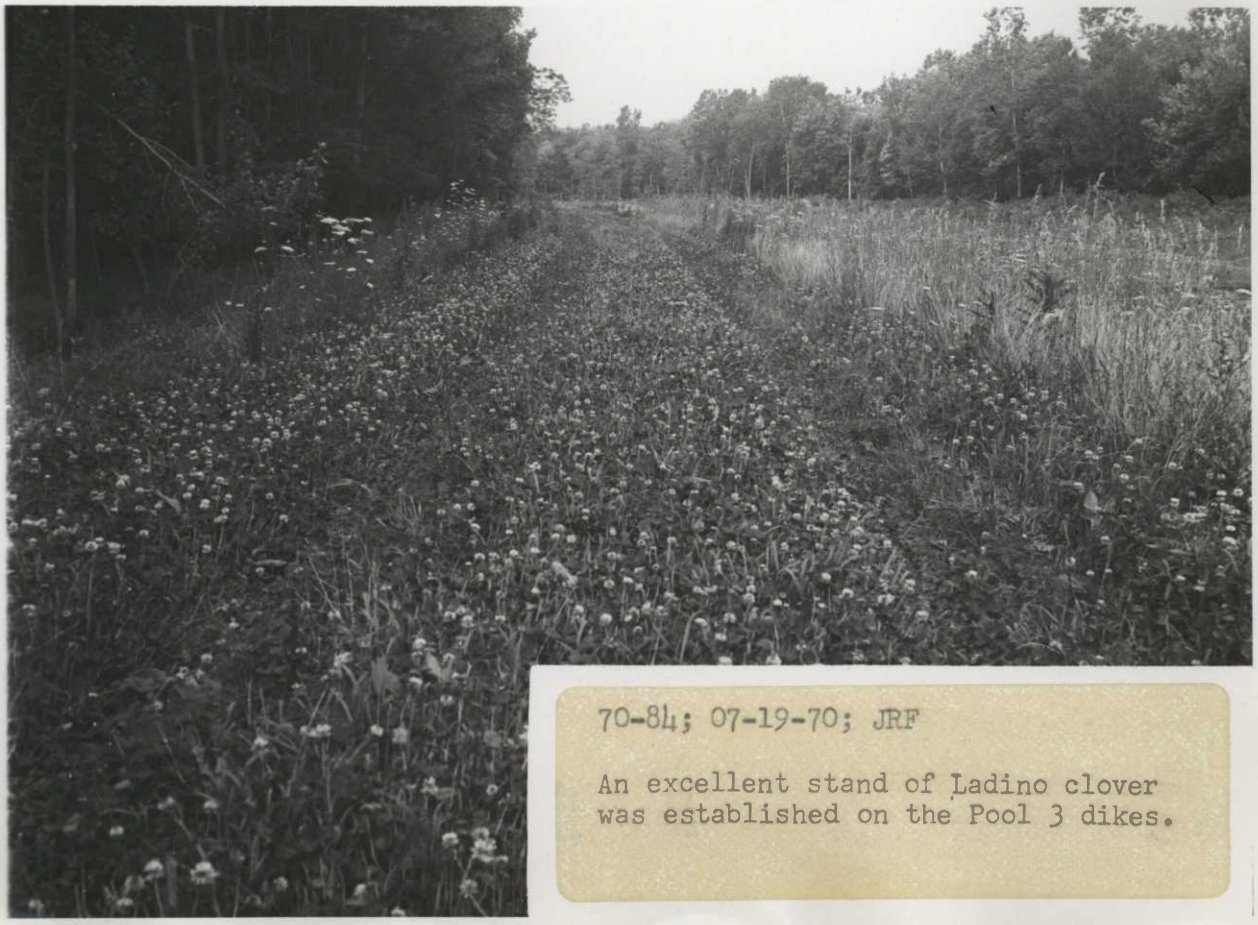


70-49; 04-27-70; JRF

The massive log jam in the Spaulding Drain was by-passed by excavation of a new channel.

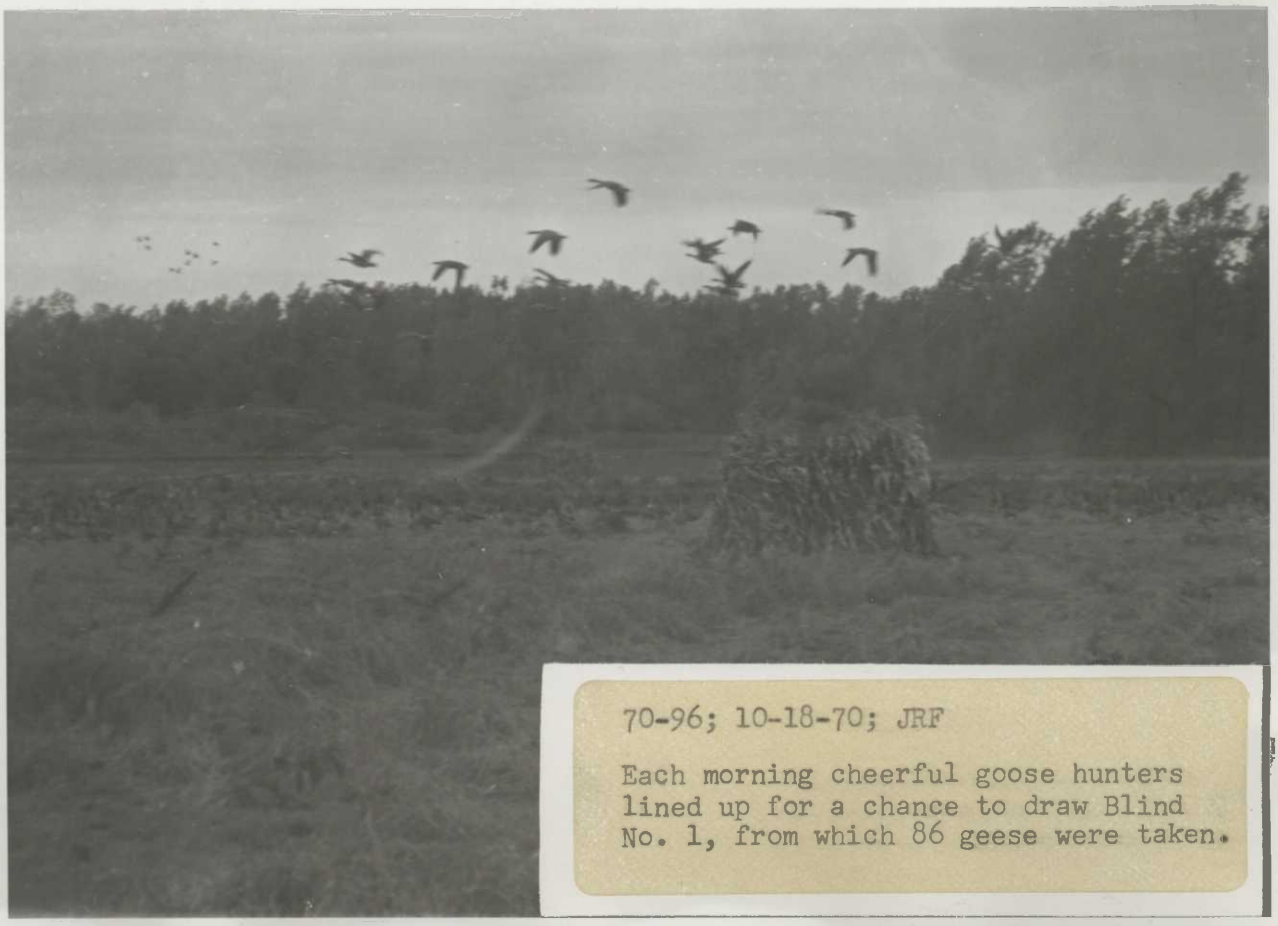
70-40; 04-24-70; JRF

The east dike of Pool 1B was lowered and widened as part of flood damage repair work.



70-84; 07-19-70; JRF

An excellent stand of Ladino clover was established on the Pool 3 dikes.



70-96; 10-18-70; JRF

Each morning cheerful goose hunters lined up for a chance to draw Blind No. 1, from which 86 geese were taken.

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Shiawassee MONTHS OF Janaury TO April, 19 70.

(1) Species	Weeks of (2) reporting period									
	1 1/1-3	2 1/4-10	3 1/11-17	4 1/18-24	5 1/25-31	6 2/1-7	7 2/8-14	8 2/15-21	9 2/22-28	10 3/1-7
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada									12	1200
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard										7
Black										2
Gadwall										
Baldpate										
Pintail										1
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:										

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Shiawassee MONTHS OF January TO April, 19 70

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	1	34	2,000	3,500	4,000	1,000	18	17	73,990		
Trumpeter											
Geese:											
Canada	20,000	25,000	30,000	30,000	32,000	32,000	6200	1,000	1,241,084		
Cackling											
Brant											
White-fronted											
Snow					3	3	4		70		
Blue					3	18	18		273		
Other											
Ducks:											
Mallard	420	430	5,000	5,000	2,500	6,000	3,000	200	157,699		
Black	146	150	1,000	1,000	1,250	1,200	500	20	36,890		
Gadwall											
Baldpate					50	50	25		875		
Pintail	30	30	300	300	6,000	4,000	1,000		81,624		
Green-winged teal					20	200	150		2,590		
Blue-winged teal					20	200	300	500	7,140		
Cinnamon teal											
Shoveler					30	100	50	100	1,960		
Wood	2	2	20	20	20	20	50	400	3,738		
Redhead			2	25	50	50	25		1,064		
Ring-necked			2	100	65	40	6	6	1,533		
Canvasback			2	100	135	6	6	2	1,751		
Scaup			150	100	275	200	200	100	7,175		
Goldeneye			30	50	10				630		
Bufflehead				30	15	20	10		525		
Ruddy						6	6	6	126		
Other (C. Merganser)	20	20	40	40	20	10	10		1,120		
Coots:	2	2	2	2	50	200	300	300	6,048		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	73,920	4,000	
Geese	1,242,227	32,000	
Ducks	305,523	12,100	
Coots	6,048	300	

SUMMARY

Principal feeding areas Farm Units 1, 2, & 6

Principal nesting areas Pools 1 and 2

Reported by Refuge Personnel

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Shiawassee Months of January to April 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great Blue Heron	2	3/18	30	4/30						30
Green Heron	5	4/27	10	4/30						10
American Bittern	1	4/24	5	4/30						5
Pied-billed Grebe	1	4/11	50	4/30						50
Eared Grebe	1	4/11	1	4/11						1
Wilson's Snipe	1	4/7	1	4/7						1
Common Gallinule	1	4/28	20	4/30						20
II. Shorebirds, Gulls and Terns:										
Killdeer	1	4/4	20	4/30						20
Lesser Yellowlegs	2	4/17	20	4/23						20
Ring-billed Gull	50	2/27	100	4/30						100

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove							
White-winged dove	Winter resident						200
IV. Predaceous Birds:							
Golden eagle							
Duck hawk							
Horned owl							
Magpie	Resident species						10
Raven							
Crow							
	50	2/26	300	3/31			
Red-tailed Hawk	1	2/27	10	4/30			300
Am. R.-legged Hawk	Winter Resident		10	March			10
Marsh Hawk	1	2/2	10	4/30			10
Turkey Vulture	4	4/4	20	4/30			10
							20

Reported by..... Refuge Personnel

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Shiawassee Months of January to April, 1970

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Croplands, bottom-land hardwoods & marsh - 8,000 ac.	800							10	Only rarely observed.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Shiawassee Year ending April 30, 1950

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
Cottontail Rabbit	8,000 ac. Croplands, bottomland hardwoods, and marshes.													Unknown
Fox Squirrel	" " "													Unknown
Red Squirrel	" " "													Unknown
Opposum	" " "			13										30
Raccoon	" " "			9	10									50
Striped Skunk	" " "			5										10
Woodchuck	" " "				12									50
Red Fox	" " "			33										30
Muskrat	1,000 ac. Cattail marsh, rivers, and drainage ditches			212				T-9937	127	85				3,000
				919				T-9938	551	368				
				265				T-9939	159	106				
Beaver	" " "			1	1			T-9938						50
Mink	" " "													Unknown
Weasel	" " "													Unknown

* List removals by Predator Animal Hunter

REMARKS:

Reported by Refuge Personnel

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Shiawassee Months of January through April, 1970

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Shelled corn	1,340	-	1,340	250	-	200	450	890		890	

(8) Indicate shipping or collection points

(9) Grain is stored at Refuge secondary headquarters granary

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Shiawassee MONTHS OF May TO August, 1970

(1) Species	Weeks of reporting period (2)									
	1 5/3-9	2 5/10-16	3 5/17-23	4 5/24-30	5 5/31-6/6	6 6/7-13	7 6/14-20	8 6/21-27	9 6/28-7/4	10 7/5-11
Swans:										
Whistling	14	1								
Trumpeter										
Geese:										
Canada	1,000	1,100	1,300	1,300	1,300	1,300	1,300	1,300	1,300	900
Cackling										
Brant										
White-fronted										
Snow	1					1	1			
Blue										
Other										
Ducks:										
Mallard	600	600	600	600	600	3,000	4,000	4,000	4,000	2,000
Black	20	20	20	20	20	500	500	500	500	300
Gadwall										
Baldpate										
Pintail										
Green-winged teal						10	10	10	10	10
Blue-winged teal	500	500	500	500	500	500	500	500	500	500
Cinnamon teal										
Shoveler	50	50				10	10	10		
Wood	400	400	400	400	400	400	400	400	400	400
Redhead										
Ring-necked										
Canvasback	6									
Scaup	100					4				
Goldeneye										
Bufflehead	6									
Ruddy	100			60						
Other										
Coot:	300	300	300	300	300	300	300	300	300	300

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Shiawassee MONTHS OF May TO August, 19 70

(1) Species	(2) Weeks of reporting period: 12/18	19/25	26/8/1	2/8 14	9/15 15	16/22 16	23/29 17	30/31 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling									105		
Trumpeter											
Geese:											
Canada	900	900	1,300	1,500	1,500	1,500	1,500	1,500	158,900	65	312
Cackling											
Brant											
White-fronted											
Snow											
Blue									21		
Other											
Ducks:											
Mallard	2,000	3,000	5,000	7,000	8,000	9,000	10,000	10,000	518,000	15	150
Black	300	300	400	500	600	700	800	800	54,400	1	10
Gadwall											
Baldpate											
Pintail											
Green-winged teal	10	10	10	50	100	100	100	100	3,640		
Blue-winged teal	500	500	500	500	1,000	1,000	1,000	1,000	77,000		
Cinnamon teal											
Shoveler									910		
Wood	400	450	450	500	500	500	500	500	54,600	10	100
Redhead											
Ring-necked											
Canvasback									42		
Scaup									720		
Goldeneye											
Bufflehead									42		
Ruddy									1,050		
Other											
Coots:	300	500	500	500	500	500	500	500	47,600	20	200

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	105	-	-
Geese	158,921	1,500	312
Ducks	710,412	12,200	260
Coots	47,600	500	200

SUMMARY

Principal feeding areas Pools 1A, 1B, Pool 2, and Farm Units 1a, 1b, 1c

Principal nesting areas Pools 1A, 1B, and 2

Reported by Refuge Personnel

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Shiawassee Months of May to August 1950

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-billed Grebe			10	August						10
Great Blue Heron			100	August						100
Green Heron			20	August						20
Common Egret	1	1 July	6	24 Sept.						6
American Bittern			10	August						10
Black Crowned Night Heron			50	August						50
Sora Rail			10	August						10
Common Gallinule			20	August						20
II. Shorebirds, Gulls and Terns:										
Killdeer			50	August						50
Greater Yellowlegs			30	August						30
Lesser Yellowlegs			30	August						30
Ring-billed Gull			100	August						100
Common Tern			40	July						40
Black Tern			60	July						60

(over)

(1)	(2)	(3)		(4)	(5)	(6)
III. Doves and Pigeons:						
Mourning dove White-winged dove		250	August			250
IV. Predaceous Birds:						
Golden eagle Duck hawk Horned owl Magpie Raven	Resident					
Crow		40	August			40
Bald Eagle		2	August			2

Reported by Refuge Personnel

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Shiawassee For 12-month period ending August 31, 19__

Reported by G. J. Bober Title Assistant Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	Acreage		(3) Use-days	(4) Breeding Population	(5) Production
	Crops	3,082	Ducks	5,523,735	500	312
	Upland	366	Geese	3,311,203	1,000	260
	Marsh	1,179	Swans	74,466		
	Water	192	Coots	69,818	300	200
	Total	4,819	Total	8,979,222	1,500	772
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form MR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Shiawassee Months of May to August, 1970

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	8,000 acres cropland, hardwoods, and marshes, bottomlands.	800	0	0					10	Rarely seen

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Shiawassee MONTHS OF September TO December, 19 70

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	15,000	18,000	20,000	25,000	14,500	5,000	5,000	4,000	1,622,530	-	-
Cackling											
Brant											
White-fronted											
Snow	10	10	10	10					574		
Blue	50	50	50	50					4,676		
Other											
Ducks:											
Mallard	45,000	45,000	60,000	60,000	20,000	7,000	1,000	1,000	3,913,000		
Black	5,000	5,000	6,000	6,000	2,000	1,000	500	500	351,400		
Gadwall											
Baldpate	50	50							6,300		
Pintail	50	50							15,820		
Green-winged teal	30	30	20						10,290		
Blue-winged teal	40	40	40						55,440		
Cinnamon teal											
Shoveler											
Wood	50	50	20	20					36,680		
Redhead											
Ring-necked											
Canvasback											
Scaup			20						140		
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coots:	100	100	50	50					26,600		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	0		
Geese	1,627,780	25,000	
Ducks	4,389,070	66,130	
Coots	26,600	500	

SUMMARY

Principal feeding areas Farm Units 1 & 8

Principal nesting areas

Reported by Refuge Personnel

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Shiawassee MONTHS OF September TO December, 19 70

(1) Species	Weeks of reporting period (2)									
	1 9/1-5	2 9/6-12	3 9/13-19	4 9/20-26	5 9/27-10/3	6 10/4-10	7 10/11-17	8 10/18-24	9 10/25-31	10 11/1-7
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	2,000	2,000	2.500	3,000	15,000	18,300	7,500	7,500	15,490	16,000
Cackling										
Brant										
White-fronted										
Snow					4	4	4	10	10	10
Blue					26	26	26	190	100	100
Other										
Ducks:										
Mallard	12,000	20,000	25,000	28,000	45,000	45,000	40,000	25,000	35,000	45,000
Black	800	1,000	1,200	1,200	3,000	3,000	3,000	2,000	4,000	5,000
Gadwall										
Baldpate		50	100	300	-	100	100	50	50	50
Pintail		10	50	100	200	200	200	100	300	1,000
Green-winged teal	100	100	200	200	500	100	30	30	30	100
Blue-winged teal	1,000	1,000	1,200	1,200	1,500	1,000	500	200	100	100
Cinnamon teal										
Shoveler										
Wood	500	500	500	500	500	1,000	500	500	200	400
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
	500	500	500	500	400	500	200	100	200	100
Coot:										

Int. Dup. Sec., Wash., D.C. 37944

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Shiawassee Months of September to December 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-billed Grebe			20	Sept.	2	Oct.				20
Great Blue Heron			60	Aug.	3	Dec. 6				60
Green Heron			20	Aug.	1	Sept.				20
Common Egret			20	Aug.	2	Sept.				20
Snowy Egret			1	Aug.	1	Aug.				1
Black-crowned N. Heron			35	Aug.	2	Sept.				35
Sora Rail			15	Sept.		Sept.				15
Common Gallinule			30	Aug.	2	Oct.				30
II. Shorebirds, Gulls and Terns:										
Killdeer			40	Sept.		Sept.				40
Yellowlegs			30	Sept.		Sept.				30
Ring-billed Gull			100	Oct.	Still	Present				200
Herring Gull			50	Oct.	Still	Present				50

(over)

(1)	(2)	(3)		(4)		(5)	(6)
III. Doves and Pigeons:							
Mourning dove		250	Sept.	Still Present			250
White-winged dove							
IV. Predaceous Birds:							
Golden eagle							
Duck hawk							
Horned owl	Resident Species						
Magpie							
Raven							
Crow	Resident Species						
Bald Eagle		2	Sept.	1	Dec. 6		2
Marsh Hawk		10	Oct.	2	Nov.		10
Red-tailed Hawk		20	Sept.	2	Dec.		20
Am. Rough-legged Hawk		1	Oct.	Winter Resident			20
Turkey Vulture		15	Sept.	2	Oct.		15
Sparrow Hawk		20	Sept.	Still Present			20

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SUR[illegible]

Refuge **Shiawassee** Year 19[illegible]0

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/1-3	277	1432	Canada Goose	120	U	120	277	120
10/4-10	446	2371	Canada Goose	75	U	75	446	75
10/11-17	432	2276	Canada Goose	214	U	214	432	214
10/18-24	338	1640	Canada Goose - 84; Blue Goose - 5	89	U	89	338	89
10/25-31	403	2227	Canada Goose	114	U	114	403	114
11/1-7	416	2297	Canada Goose	100	U	100	416	100
11/8-14	384	2016	Canada Goose	20	U	20	384	20
Sub Totals	2,696	14,259	Blue Goose : 5 Canada Goose : 727	732	U	732	2,696	732
Permits Issued by State								
10/1-31	385	1500	Canada Goose	127	U	127	385	127
11/1-14	137	468	Canada Goose	7	U	7	137	7
TOTAL	3,218	16,227	Canada Goose : 861 Blue Goose : 5	866	U	866	3,218	866

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge **Shiawassee** Months of **September** to **December**, 19**70**

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	**Croplands, Bottom-land hardwoods & marsh- 8,000 Ac.**	**600**	**0**	**0**					**10**	**Rarely observed**

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Shiawassee Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	Bottomland hardwoods, croplands, Marsh- 8,000 ac.	350	11	0					2			840	735	1:4

Remarks: Estimated removals by hunting include 40 taken during the firearms season, 40 during the archery season, and an estimated 30 illegal and/or unretrieved kills.

Reported by Refuge Personnel

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5

DISEASE

Refuge Shiawassee Year 1970

Botulism

Period of outbreak None

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease Lead Poisoning

Species affected Whistling Swan

Number Affected

Species	Actual Count	Estimated
Whistling Swan	3	

Number Recovered _____

Number lost 3 Actual Count

Source of infection Presumed on wintering area

Water conditions _____

Food conditions Each year a small loss of swans are recorded during the spring migration. It is presumed the lead is ingested on the wintering grounds and birds weaken and die enroute to nesting grounds.

Remarks _____

INT.-DUP., D.C.- 53818-59

3-1757
Form NR-7
(Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS (1)

Refuge Shiawassee Year 19 70

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
							Farm Unit 1A	2 lbs. acre	.5± acres	Ladino Clover	May		
							Riverside Dike	2 lbs. acre	2.7 acres	Ladino Clover	April		
							Picnic Area	2 lbs. acre	.5 acres	Ladino Clover	May		
							Pool 1B East Dike	12 lbs. acre	3.6 acres	Bromegrass Tall fescue Ryegrass & Ladino clover mixture	May		
							Nature Trail	2 lbs.	1.0 acres acre	Ladino Clover	May		

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

76148

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge SHIAWASSEE REFUGE County SAGINAW State MICHIGAN

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
SOYBEANS	372	15,632	16	667	16	667	416	Ryegrass in corn	197
WHITE BEANS	786	8,858	16	180			802	Clover w/sm. grain	231
FIELD CORN	419	36,613	14	1,035	230	19,957	663	Wheat/rye/oats	456
BLACK TURTLE BEANS	74	1,096					74	Winter wheat	109
KIDNEY BEANS	51	491					51		
SORGHUM					32	1,280	32		
BUCKWHEAT					296	14,800	296		
WHEAT	75	2,546			45	1,485	120		
BARLEY	50	955			236	11,800	286		
OATS	38	2,500			9	540	47	Fallow Ag. Land	0
SUGAR BEETS	158	3,397			28	616	186		

No. of Permittees: Agricultural Operations 17 Haying Operations 1 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
ALFALFA	30.05	30	$210.35	1. Cattle				
				2. Other				
				1. Total Refuge Acreage Under Cultivation				2,992
Hay - Wild				2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C.91767

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Shiawassee Months of May through December, 1970

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Shelled Corn	890	1,035	1,925	588	-	500	1088	833		113	720

(8) Indicate shipping or collection points

(9) Grain is stored at Refuge secondary headquarters granary (113 bu.) and 720 bu. Birch Run Elevator

(10) Remarks Surplus for transfer to Seney Refuge and Ottawa Refuge

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge Shiawassee Year 1970

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Szepanski Saw Mills, Inc.	70-2-T	Pool 3	300	All merchantable timber	Lump Sum	$16,000	None	Bottom land Hardwoods

Total acreage cut over 300 Total income $16,000.00

No. of units removed B. F. ..... Method of slash disposal No special requirements

Cords .....

Ties .....

.....

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Shiawassee

Proposal Number:

Reporting Year: 1970

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
June 18 to July 22	Willow, Cottonwood, Canada Thistle, and Nettles	Dikes, road ditches, drainage ditches and ditch banks	18	2,4-D	36	2 lbs/Acre	Water 3 pts. chemical per 125 gals.	Truck mounted broadjet sprayer

10. Summary of results (continue on reverse side, if necessary) 10% kill on all target species

35500